THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

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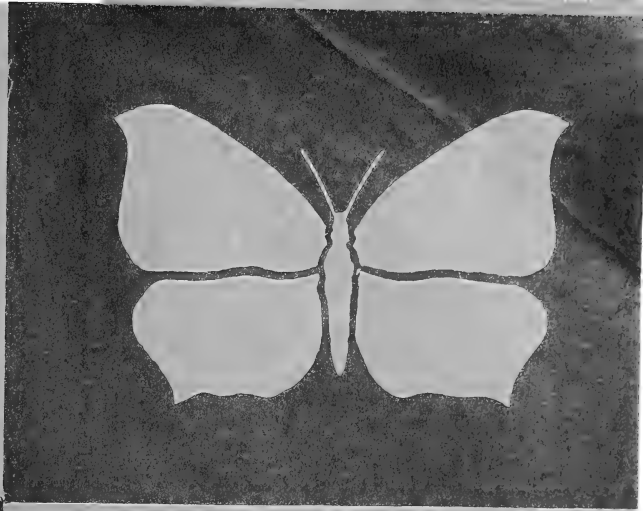

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AES
BULLETIN

No. 278
FEBRUARY, 1968

EDITORIAL

The advisability of breeding Lepidoptera for release has recently become a topic of discussion in the *Bulletin*. The Members who considered that such releases prior to full studies and without proper control were harmful, were further disquieted by the existence of the AES Breeding Group—which had the general aim of rearing butterflies for release.

The AES Council have had in mind the necessity of conservation of our insects and their habitats, and there has now been derived an Amateur Conservation Group within the Society. The Breeding Group has ceased to exist, any activities in this direction being incorporated into the much broader-based Conservation Group, the aims of which are set out in an article in the following pages by the convener of the new group, Mr K. J. Willmott.

The Council is able to give its full support to the new group, which will cooperate with the various existing local and national bodies for nature conservation but—unlike most of them—exists as representative of entomologists. There is certainly a need in the AES for such a coordinating group concerned with conservation, and it is to be hoped that Members will give it their fullest support. There is a very great deal to be done along the lines indicated by Mr Willmott—and this requires that as many Members as possible share in the activities of the new group.

The report on the successful 1967 Annual Exhibition has unfortunately been delayed, and will appear in the next issue. The first and second Junior Exhibitors' Prizes were awarded to Mr A. Lucas (3934J) and Mr D. V. Lewis (3963J) respectively. Fuller details will be published in the Exhibition report.

Finally, may I draw the attention of Macrolepidopterists to Mr Emmet's provision, in his Smaller Moths Collecting Notes following, of a pathway to take them into the rewarding study of 'Micros'.

H. V. Danks (2907).

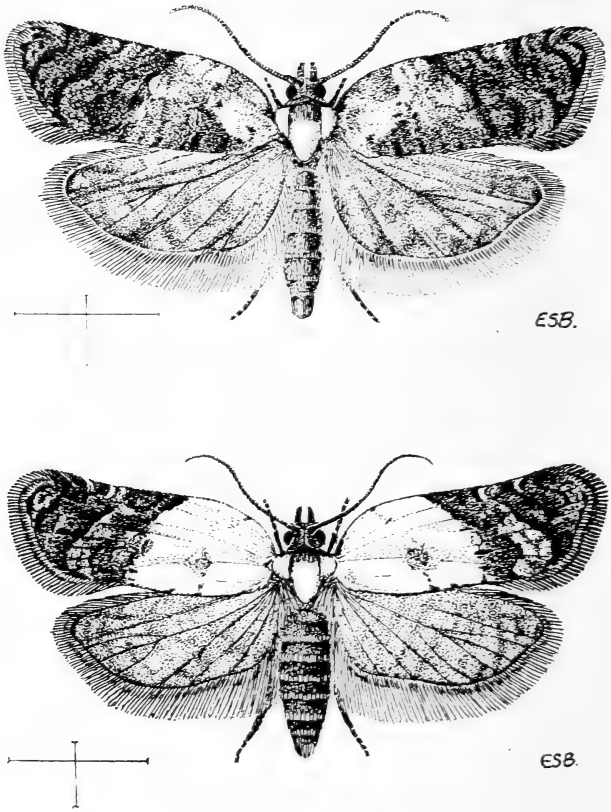
Front cover illustration: Stages in the life-cycle of the Camberwell Beauty Butterfly (*Nymphalis antiopa* Linn.), drawn by Mr A. M. Freebrey (3359).

COLLECTING NOTES FEBRUARY 1968

The Smaller Moths

Acleris variegana Schiff. Mr E. S. Bradford drew the lower specimen some years ago and, forgetting that he had done so, drew the upper one last winter. As the two portraits represent different forms of the same species, I thought it would be of interest to show them together. Mr Bradford wrote two sets of notes to accompany the drawings; these I have amalgamated, as far as possible retaining his original words.

"This, as its name suggests, is a variable species. The upper drawing is from a fairly normal specimen bred from Hawthorn (*Crataegus* sp.), while the lower is from another bred from a rambler rose (*Rosa* sp.) in the garden. The larva also feeds on Blackthorn (*Prunus spinosa* Linn.); it folds a leaf of its foodplant or spins two leaves together.



Acleris variegana Schiff.

"The usual form of the imago, like the one in the upper drawing, has a creamy ochreous basal patch, the terminal patch being bluish or purplish black with reddish scales. The form illustrated in the lower drawing has the basal half of the wing of a pale cream colour. I have specimens in which the forewings are a deep bluish black all over. One feature common to nearly all specimens is the orange-brown cilia at the apex, fading towards the inner angle of the forewing. In fresh specimens one can see tufts of scales sticking up all over the wings; hence the old or common name, the 'Rough-winged Button'. The hindwings are a pale greyish brown and in most specimens there are darker markings like a mosaic or tracery. The adult is on the wing from July till September."

A general under whom I served in

the war recently became one of the writers of the Official History of the Second World War. Before accepting his invitation, he asked for whom he would be writing—staff-college students, those who took part, foreigners assessing the British image, the general public or posterity. It makes so much difference to what you say and how you say it. He received no very satisfactory answer: he would be writing for them all. If I asked the Editor a similar question, I would expect an equally evasive reply, for what could he say? Now in this article I have decided to write for a very limited class of reader—for the collector of 'Macros' who is attracted to the 'Micros', but is fearful of taking the plunge. I am going to suggest to him fifteen common species, the larvae of which he can readily find in most parts of the country before the next issue of the *Bulletin* appears. Let him search for them, rear them, and throw away his 'L' plates. So the hoary old campaigner should turn the page and go straight on to the Hymenoptera Aculeata.

I have selected three species of the Tortricidae. *Epinotia tedella* Clerck feeds on the needles of Spruce (*Picea abies* (Linn.) Karst), spinning them together and blanching them; fresh feeding is of a greenish white colour. Collect at the end of February. *Endothenia gentianaeana* Huebn. feeds on the pith in the heart of the heads of teasel (*Dipsacus* spp.). The larvae are full-fed in the autumn, but do not pupate until the spring: gather them at any time. If you put on stout gloves and rip open thistle (*Carduus* spp.) stems, you will probably soon locate the pinkish larva of *Epiblema scutulana* Schiff. If you wait until April, you should also find pupae.

From the Gelechiidae I have chosen *Caryocolum tricolorellum* Haw. During late February or early March, collect the spun tender shoots of the Greater Stitchwort (*Stellaria holostea* Linn.)—a plant which is common under most hedgerows.

I have selected the largest of the Cosmopterygidae, namely *Limnoecia phragmitella* Staint; the larvae are found in the shaggy heads of bulrushes (*Typha* spp.). Among the Oecophoridae is *Dasycera sulphurella* Fab. If you prise off the loose bark from the dead stumps of oak or other trees (or even from fallen branches), you should soon come across its whitish larva—and, possibly, other more exciting species. You should wait until April for my Glyphipterygid: then almost any patch of nettles (*Urtica dioica* Linn.) will yield loosely spun leaves containing larvae of *Simaethis fabriciana* Linn.

Here are three suggestions for the Hyponomeutidae. The needles of Pine (*Pinus sylvestris* Linn.) are mined in March and April by the larvae of *Cedistis farinatella* Dup. If you pick the catkins of birch (*Betula* spp.) in April, concentrating on those which are distorted, you should get larvae of *Argyresthia goedartella* Linn. and the more beautiful but slightly less common *A. brockeella* Huebn.

It is rather early for the Coleophoridae, but you should be able to find *Coleophora gryphipennella* Bouch. on rose shoots by the middle of April. Look out for the characteristic 'windows' in the leaves, with the neat, round hole in the lower cuticle.

You should readily be able to find three species of *Lithocolletis*. Search Beech saplings (*Fagus sylvatica* Linn.) which have retained their leaves and you will almost certainly find the mine of *L. faginella* Zell. on the underside; you can start collecting them right away. You should, however, wait longer for the other two species. These are *L. messaniella* Zell. in Holm Oak (*Quercus ilex* Linn.)—passim—and *L. trifasciella* Haw. in the young leaves of Honeysuckle (*Lonicera periclymenum* Linn.); by mid-April, if

you search in woods, you should start finding the inflated, twisted and often discoloured leaves containing the larvae of the latter species.

From the Lyonetiidae I have picked *Tischeria marginea* Haw., which puckers the leaves of the evergreen bramble (*Rubus fruticosus* agg., part) with rather a pear-shaped mine. The larvae commence feeding in the autumn and complete their growth in the spring; so the leaves may be located in the early months of the year, but should not be picked until April. Much the same applies to *Nepticula aurella* Staint.—my final selection—which also hibernates in its mine and the long galleries of which are conspicuous in the leaves of the same foodplant; but these larvae leave their mine to pupate and, if it is a mild spring, they will be gone early in the month.

If you get all fifteen of these species, you are doing well. Just to see if you are on your toes and to make it a little easier, I have, in fact, given you sixteen! And you experts, if against my advice you are still with me, what different selection would *you* have proffered to a hypothetical beginner, bearing in mind that we should try to represent most of the families?

A. M. Emmet (1379).

The Hymenoptera Aculeata

Now is the time for taking stock of past seasons and looking forward to, and planning for, the future. One topic I have had in mind relates to ants, and in particular to the marriage flights of the common species of *Lasius*, *L. niger* Linn. and *L. flavus* Fab. Both these species are abundant and widespread and have important influences on the ecological processes of our countryside. The winged forms emerge in summer, sometimes as early as July, but more usually in August, and on into September in some years. Nests of these species are founded by single fertilised queens. These, therefore, have to carry within themselves on their marriage flights sufficient nutrients to support themselves for the period until the following spring and also to allow the first few workers to be reared. The production each year of large numbers of these winged queens obviously injects into the environment an important food source, and many predators take advantage of this, the best known being birds.

The particular feature that has interested me is the habit of gulls in circling to take these flying ants in the air. The only species I have definitely identified doing this is the Black-headed Gull, *Larus ridibundus* Linn. The bare fact that gulls hawk for ants is recorded by Donisthorpe (1927, p.237). In quoting only one example (Putney, 20th August 1921) he gives this association equal status with the taking of winged ants by such birds as Swallows (*Hirundo rustica* Linn.), Sparrows (*Passer domesticus* Linn.) and Starlings (*Sturnus vulgaris* Linn.) (he also gives one record of a "Lesser Tern" (*Sterna* sp.)). However, I feel that this habit of gulls represents a significant adaptation of their normal behaviour. This is not the case with the other birds named which habitually feed on the wing.

I first noted gulls taking flying ants on 3rd August 1964 at Sittingbourne. How often before that I must have seen them without really noticing, I don't know. Since then I have noted this behaviour each year in this area, from Rainham to Herne Bay, the earliest date being 23rd July, in 1966, the latest 19th September, in 1965. I have also seen the same behaviour on the Belgian coast at Westende (11th August 1965 and 22nd August 1967). Indeed I now find that the behaviour of the gulls in an area is a very sensitive indicator of the occurrence

nd extent of an ant flight.

The behaviour of the gulls in such lights is very characteristic. The ndividual birds fly slowly round, liding interspersed with rather rapid ving beats noticeably fast for the ctual speed of flight. During this ircling catching movements are nade, either of the head only or of he whole body as the culmination of eries of rapid wing beats. The flocks eem rarely to be of less than twenty r thirty birds, and often more than 00 are involved, circling up to 200 300 ft. More rarely some birds will woop down below tree-top height, ay 30-50 ft.

Two points interest me. First, how ong established and how widespread s the habit, and can the occurrence f flocks be used to follow the area ver which ant flights are synchro- ised? As to the first point, the Black- eaded Gull is a species which has narkedly changed its habits during his century, changing from a coastal ird to one that feeds widely over the ountryside. The change of behaviour hat enabled this to occur proved a ery successful one for the species, nd perhaps the present case is nother example. The species has dapted its normal circling behaviour, n thermals and up-currents by the ea, to the taking of flying ants which ormally occur under conditions of hermal activity.

On both points I now appeal to my eaders. If AES Members would make point during the coming season of vatching for the behaviour I have escribed and if they do see it make note of the place, date, species of ull, and whether or not the presence f flying ants was confirmed, a picture vould quickly build up of the present istribution of the habit. It would lso be apparent to what extent bservations of this sort would form convenient way of studying the ynchronising of the marriage flight f ants over wide areas. I look forward to hearing from Members at the end of the season.

26.10.67. J. C. Felton (3740).

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SCOTTISH ENTOMOLOGY 1966

[Continued from *Bull. amat. Ent. Soc.*, **26:** 109-14.]

Coleoptera (*by J. Cooter*)

My notes have been compiled from the list of Coleoptera collected by my father during May 1965 and June 1966 when he was on holiday as a volunteer warden at the Loch Garten Bird Reserve near Nethy Bridge, Inverness-shire. Mr J. K. Smith kindly sent me a list of the rarer species that he collected in September 1966 at Loch Garten. Many of the beetles are not true Scottish species and quite a few are widespread occurring in most parts of the British Isles.

(The collecting season—when the coleopterist stops using collecting methods he has been using in the winter—begins about a month after it does in the south of England, *i.e.*, the end of May.)

My father found that the best collecting method to use in early spring was to pull up handfuls of wet feathery moss, squeeze it gently to get rid of any excess water, then shake the moss over a white sheet, or old plastic table cloth—as my father used. Any large beetle can then be captured and put into a tube, whereas the small fry can be collected with a pooter as they run across the cloth. While in Scotland in June, my father found moss to be unproductive and other methods of capture had to be employed.

Most of the beetles found in the moss belonged to the Adephaga,

although large numbers of Staphylinids were also present. Several rare and local species were collected, namely a short series of the rare *Agonum scitulum* Dej. and a single example of the pretty *A. ericeti* Panz. Several 'northern species' such as *Nebria gyllenhali* Schoenherr and the var. *balbii* Bonelli were taken. *Trichocellus cognatus* Gyll. and *Patrobus atrorufus* Stroem were not too common. *P. atrorufus*, a moorland species, is more common in the north than in the south. It does occur in the south, however, and I have captured a specimen near Brockenhurst in the New Forest, Hampshire. Perhaps the most common beetles in the moss and elsewhere were three species of *Calathus*, namely *C. melanocephalus* Linn. var. *nubigena* Hal., *C. micropterus* Dufts. and *C. piceus* Marsh. Other species of the Carabids include *Pterosticus oblongopunctata* Fab. *P. diligens* Sturm and several smaller beetles which I still have to name. Among the Staphylinidae were lots of common species and only a few rarities from moss; a specimen of *Atheta* (*Liogluta*) *hypnorum* Kw. and two uncommon 'staphs'—*Atheta* (*Metaxya*) *arctica* Thoms. and *A.* (*Hypatheta*) *aquatica* Thoms. Two specimens of the large *Staphylinus erythropterus* Linn. were captured in mid-June under stones at the side of Loch Garten. One example of *Ocypus brunnipes* Fab. was taken while my father was taking the bark off a dead birch (*Betula*) log. I have only found this beetle hibernating under bark. This may be only coincidence. Some of the more common 'staphs' were *Quedius molochinus* Grav., *Q. fuliginosus* Grav., *Philonthus marginatus* Stroem, *P. politus* Linn. (=*aeneus* Rossi), *Lathrobium elongatum* Linn., *Stenus impressus* Germ., *Anthobium unicolor* Marsh (from fungus), and several very small species probably from the genus *Atheta* and related genera. Three specimens of *Xantholinus tricolor* Fab. from Glenmore were captured under stones. Mr Last informs me that this species is found more in Scotland than in England.

By luck my father captured an example of the large *Carabus glabratus* Payk. var. *lapponicus* Born at the edge of a road running through the Abernethy Forest where he also took a specimen of *Cicindela campestris* Linn., a beetle usually found in the south or coastal districts in the north and midlands, on sandy heaths or sand dunes. This particular specimen was found in a peaty region. In early May the Hydradephaga and aquatic Palpicornia can be easily netted. Several specimens of *Agabus sturmii* Gyll. and *A. bipustulatus* Linn. as well as a single specimen of *Ilybius fuliginosus* Fab. were captured. Unfortunately, they can be taken in almost every other pond in the United Kingdom! Smaller members of the family (probably *Hydroporus*) were also captured, as were a few uninteresting aquatic Palpicornia.

Only two species of Chrysomelidae were captured. One copper-red specimen of *Plateumaris discolor* Panz. was found in moss at the loch side. Sweeping the reeds later in June failed to produce any more of this species or any more of the aquatic Chrysomelidae. *Lochmaea suturalis* Thoms., a very common insect in nearly all parts of the country, was abundant in mid-June on the heather.

To my pleasure, two northern species of Cerambycidae were captured by my father. One specimen of *Pogonocherus fasciculatus* Deg. appeared in the water net. This beetle is found in the south-east midlands (Lincolnshire?) but is believed to have been imported from the north. Three examples of *Rhagium inquisitor* Linn. were found early in the morning on freshly cut fir palings in the Abernethy Forest. Mr J. K. Smith found several of this species near Loch Garten. *Rhagium bifasciatum*

Fab. was also found. Some larvae brought home by my father proved to be *R. bifasciatum*. Only two species of Curculionidae were collected, these being *Hylobius abietis* Linn., presumed to be a pest in some forests, the other being the rare *Eremotes ater* Linn., a northern insect. Although listed by Joy (1932) as being rare, my father has collected a series of this beetle each time he has been in Scotland. (He told me that he didn't take too many of them because he found it so commonly and thought that I must have caught it myself!) It can be found on decaying trees or stumps in the Abernethy and Rothiemurchus Forests.

A very good find was *Dictyopterus aurora* Herbst. Several of this species were found in a rotten tree stump in the Rothiemurchus Forest. This is a truly northern beetle, being found only in parts of Scotland.

Mr Smith found a single example of the rare and beautiful *Pytho depressus* Linn. under the bark of a Scots Pine log (*Pinus sylvestris* Linn.). Another Scottish beetle, it is found in North West areas of Scotland extending south to Aviemore.

Geotrupes stercorosus Scriba was fairly common in the Abernethy Forest and was the only large member of the Scarabaeoidea noted. The true northern *Aphodius* beetles were fairly common—*A. nemoralis* Erichson was to be found in deer or sheep droppings. (Britton (1956) states that *A. nemoralis* is rare and found in deer droppings in Scotland.) *Aphodius lapponum* Gyll. was not as common as I expected. Britton states that *A. lapponum* is a northern and mountain species, rare except in the Scottish Highlands. It was also found in sheep or deer droppings. Other dung beetles include *Aphodius ater* Deg., *A. depressus* Kugelann, *A. rufipes* Linn., *A. fimetarius* Linn., and *A. aestivalis* Steph. A single specimen of *Serica brunnea* Linn. was bred from a pupa found in the Abernethy Forest.

Several specimens of *Thanatophilus rugosus* Linn. were found in carrion and in carcases. One example of *Oeceoptoma thoracicum* Linn. was found in a rotten Swede (*Brassica napus* Linn.) and several others were under pieces of wood, etc. Only one example of the handsome *Aclypea* (=*Blitophaga*) *opaca* Linn. was captured. Mr Smith found five specimens of *Dendrophagus crenatus* Payk. near Loch Garten.

I would like to thank Mr D. Tozer, Mr H. Last, Mr J. Balfour-Browne, and Mr R. Adams for identifying some of the insects that were collected, Mr J. K. Smith for supplying a list of the Coleoptera that he captured in Scotland and my father for collecting so many beetles for me in his spare time.

Trichoptera (by Brian Morrison)

During the past year, practically all my observations have been confined to a stretch of the Union Canal which lies on the boundary of Edinburgh and over which crosses the road (A70) to Mid-Calder. I decided I would try to record the times at which the various species could be found in the adult state in this rather restricted area rather than go on hunting expeditions far and wide over the countryside.

With regard to the Canal itself, there is very little to say. The bottom is muddy with a dense population of water weeds of various sorts, particularly *Fontinalis*, *Elodea* (*Anacharis*) *canadensis* Michx. (Canadian Pondweed) and near the banks there is a profuse growth of *Potamogeton* sp. in some areas. The surface of the water, particularly in summer, becomes covered with a mat of duckweed (*Lemna* sp.). The fauna is very rich in still-water species and caddis larvae are particularly numerous. The accompanying table (*Table* 3) gives the results of my researches on adult

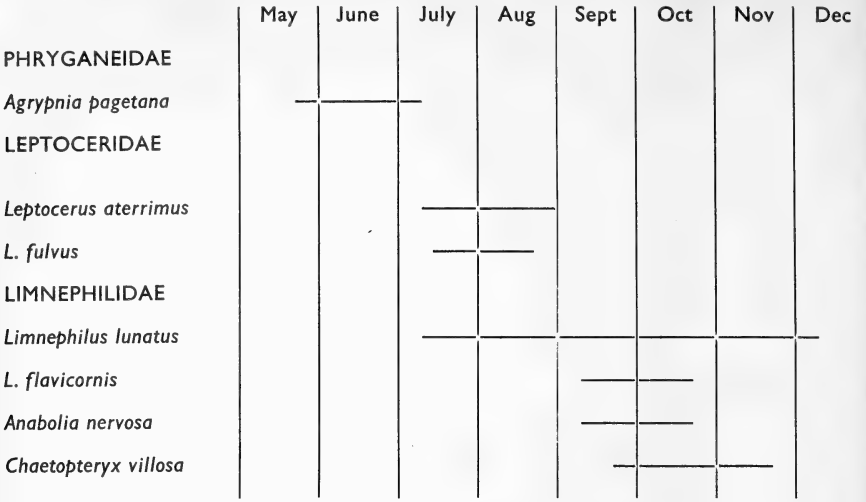

Table 3: Diagram showing flying times of several species of Trichoptera found by the Union Canal.

In addition to the above, occasional examples of other species were found:
Limnephilus sparsus—8.8.66.
L. nigriceps—3.10.66 and 10.10.66.
L. rhombicus and *Stenophylax* sp.—22.9.66.

emergence but I am certain that there are several other species present judging from the types of larval cases found.

Instead of giving a long discourse on the subject I would just like to mention one or two points which might be of interest and which I feel are worthy of further investigation.

As I mentioned earlier, part of the Canal runs under a road bridge and in the course of the season I made a number of visits to the bridge to look for insects which might be resting on the underside of it. I was able to examine parts of it from the towpath which was about six feet broad.

The large Phryganeids (*Agrypnia pagetana* Curtis) were found almost always hidden in the crevices in the stonework rather than on the surface. *Anabolia nervosa* Curtis and *Chaetopteryx villosa* Fab. were only very rarely found under the bridge, but in season were extremely common on grasses and other plants growing on the Canal banks. *Limnephilus lunatus* Curtis and *L. flavicornis* Fab. were very common both under the bridge (not usually in crevices) and on vegetation on the canal bank and at the edge of the towpath.

Leptocerus spp. were found most commonly at a position resting on the side wall of the towpath, very often near empty pupae, and also flying very close to the bank, rarely straying far from the water. *Limnephilus* spp. on the other hand were never found at the towpath edge under the bridge and were quite commonly found 100 to 200 yards away from the canal on fence posts by the roadside.

One point of interest is that around the fifth of July I discovered several larvae at the edge of the towpath next to the arch of the bridge. I am not sure what species they were but I am fairly certain that they were Limnephilids. The fact that I subsequently found empty pupal cases and Limnephilids with not fully expanded wings on the arch of the bridge just above the towpath makes me feel more certain about this. If this is so, it seems that these larvae emerge from the water when full

grown and pupate on land. This has still to be verified. I have not come across any other such accounts of this behaviour.

It will be seen from the table that *L. lunatus* is to be found right through December. Specimens dissected at that late date were found to be full of eggs. During the recent XIIth Entomological Congress in London, a paper was submitted in which it was stated that many Limnephilids which inhabit bodies of water which are seasonal in times of appearance, *i.e.*, late summer and autumn, actually emerge in spring but remain in hiding until later in the year when they can lay their eggs in the newly formed pools. This makes me wonder whether Limnephilids might hibernate in certain circumstances. I am told this is very unlikely, but I hope to investigate the matter further. It seems to me interesting too that adults with eggs can be found as late as December.

If any Member is keen on taxonomy then the Trichoptera offer ample scope. Work has been done on the genus *Limnephilus* (and one or two other genera), and on the Leptoceridae, in more recent times, but a lot remains to be done. The trouble with the key in Mosely (1939), which is still the standard work, is that the diagrams are not always reliable and it is often impossible to determine single specimens if they are female.

The following is a list of species taken in the area discussed:

Agrypnia pagetana Curtis, *Leptocerus fulvus* Rambur, *L. aterrimus* Steph., *Limnephilus lunatus* Curtis, *L. flavicornis* Fab., *L. nigriceps* Zett., *L. sparsus* Curtis, *L. rhombicus* Linn., *Anabolia nervosa* Curtis, *Chaetopteryx villosa* Fab.

Papers in other journals

The following three papers on Scottish insects were published in 1966.

HARPER, G. W. (1966). *Ent. Record*, 78: 50-2. Inverness-shire in 1965.

MAITLAND, P. S. (1966). *Entom.*, 99: 72-81. The distribution, life-cycle and predators of *Amphinemura succicollis* (Stephens), Plecoptera, in the river Endrick, Scotland.

PELHAM-CLINTON, E. C. (1966). *Ent. Record*, 78: 43-5. *Cossus cossus* (Linn.) in Scotland.

General

I find it a useful discipline to note when the first specimens of certain groups make their appearance, as it gives a general indication as to whether the season is an early or late one. *Table* 4 shows the comparative emergence dates for four main groups which have not been mentioned in the report so far. Unfortunately it is not possible to give anything other than the name of the Order for two of them. Perhaps this will encourage some Members to contribute to these aspects of Scottish Entomology for my report for the season 1967!

	First rcd. 1966	First rcd. 1965
Apis sp.	1.4	29.3
Bombus sp.	23.4	31.3
Odonata	29.5	29.5
Orthoptera	11.7	29.6

Table 4: Some first and last records.

20.3.67. George Thomson (3689).

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THE AIMS OF THE AMATEUR CONSERVATION GROUP

1. The present AES Breeding Group will no longer exist, but will become a part of this new AES group and will

have an entirely new constitution.

2. The main aims of the Amateur Conservation Group are as follows:—

—To assist and cooperate with county and local conservation groups in order to interest them in, and advise them on, the conservation of insect fauna and suitable areas which should be given special attention.

—To collect and collate information on local insects and the status of the insects and their habitats for use when such insects or areas are in danger.

—To breed and supply insects for nature reserves and special areas where it has been agreed with other interested groups that this is desirable.

—To supply an annual report to the Society on the conservation activities of the group and to encourage all Members to be active in this field.

3. As regards the collection and collation of information as mentioned above, it is suggested that the group should undertake studies of various species, not only the rare and local species but also those termed uncommon. Such suggested studies include work on the Glanville Fritillary (*Melitaea cinxia* Linn.) on the Isle of Wight; the Heath Fritillary (*Melitaea athalia* Rott.); the Purple Emperor (*Apatura iris* Linn.); and the Adonis Blue (*Lysandra bellargus* Rott.). These four species, along with others, need careful conservation studies within the next couple of years, and it would be wise to note details such as population numbers; distribution; rearing in captivity for possible release; distribution of foodplant and its conservation; and advice for future conservation efforts.

4. If any Members could undertake other detailed work on species needing such a study, would they please contact the group convener as soon as possible giving details.

5. The possible breeding and supply of insects for release relates to the late Breeding Group. Members would rear Lepidoptera for release in suitable localities to repopulate areas with species that have become uncommon for some reason. I must here note certain conditions for rearing species for release, and I would be grateful if Members would inform me of any personal efforts in this direction, giving the species they are rearing and the localities these are to be released in.

Suitable methods and conditions for releasing bred stock are as follows:

A. Augmenting a species by protected breeding of additional specimens procured from that same habitat. Such breeding should be done in as near natural conditions as possible. This method is being used successfully with some species including the Large Copper (*Lycaena dispar* Haw.) at Woodwalton Fen.

B. Putting down of a species in a new area where it has never occurred or from which it has disappeared owing to some detrimental factor such as ploughing up, forestry changes, etc. This is not always successful as it is difficult to gauge all the factors, and micro-climatic or soil factors may be disadvantageous. Whenever such a venture is proposed it is well to obtain the interest of the landowner and the County Naturalists Trust, and inform the Natural History Museum at South Kensington, S.W. 7, of what you are doing (Mr Howarth is an AES Member).

C. General release of excess bred specimens of common species (*e.g.*, Vanessids). This is a very haphazard business and little data are available on the effect or success of such operations. With species which naturally have a wide dispersal it is probable that no harm can be done.

D. Release of introduced species.

This should be done only with species which are restricted in habitat if any proper records are to be kept and the chance of the introduction spreading is to be avoided. Parasites and virus diseases are of course a danger to our native species, which may not be prepared for them, and generally I would advise against any introduction of foreign species, or foreign stocks of our native butterflies.

The Amateur Conservation Group

A newsletter will be sent to each member now and then, and especially when group activities become interesting and important projects are suggested. In November of each year an annual report will be prepared with all members of the Group contributing articles.

Members should keep the convener well informed of their activities throughout the season, and of their plans before they become active in the season, reporting such matters as species being reared, studies, released and successes and failures.

A list of livestock is expected to circulate through the Group and will be published in March or April, listing spare livestock each member hopes to have and also livestock he requires for rearing.

Membership lists will occasionally be published and circulated.

18.9.67. K. J. Willmott (3822).

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THE TRANSFER OF SEMEN IN THE INSECTA

The two previous articles in this series (Wightman, 1967a and b) have described the anatomy of the female and male reproductive systems and the production of gametes in the insects. This article describes the methods by which spermatozoa are passed from male to female.

In general, true aquatic animals have no problems in effecting fertilization; a male and female merely come together and emit the gametes. Terrestrial animals have greater problems, in that, if the gametes were shed into the environment, they would immediately be subject to dessication. To overcome this problem several mechanisms have evolved. Land snails, for instance, transfer semen enclosed in calcareous 'love darts', whereas in terrestrial vertebrates the sperm is introduced directly into the reproductive canals of the female. Both of these processes necessitate *internal fertilization*. In insects there is great variation in *copulation* methods, but they are, in general, analogous to the two methods mentioned above, *i.e.*, either a sperm is transferred directly into the female's genital tracts by an intromittant organ, the *aedeagus*, or they may be enclosed in a 'packet' secreted by the male, called a *spermatophore*, and inserted into the *bursa copulatrix* of the female.

These two methods are scattered throughout the Insecta, quite closely related species employing the different methods. *Oncopeltus fasciatus* Dallas, the milkweed bug, has a long, eversible intromittant organ carried coiled up in the genital capsule. During mating the fluid is pumped into this organ so that it becomes distended, and enters the female's *bursa copulatrix*. Spermatozoa can then be deposited in the *spermatheca*, where they are stored until needed for fertilization. In the closely related blood-sucking bug *Rhodnius prolixus* Stahl., a spermatophore is formed. This is a pear shaped object (see *Fig.* 1) with the spermatozoa enclosed in the 'neck'. It is jelly-like in substance, and is the product of the male accessory glands. During copulation the intromittant organ, much shorter than in *Oncopeltus*, is inserted into the bursa copulatrix of the female, the spermatophore (with spermatozoa) is secre-

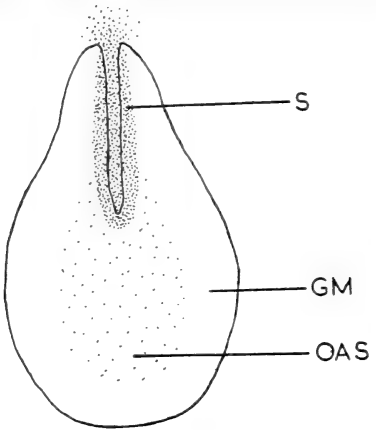

Fig. 1. Spermatophore of *Rhodnius*.
Key: GM = gelatinous matrix; OAS = opaque accessory secretion; S = semen.

ted, and the male withdraws leaving it behind. The whole process takes about thirty minutes. The spermatozoa are then transferred to the spermatheca by rhythmic contractions of the oviducts which are triggered off by a secretion from the spermatophore.

In *Rhodnius* the spermatophore merely acts as a plug to hold the sperm in place, whereas in the orthopteroid orders it is a more complex structure, composed of a number of membranous sacs. Female mantids have been observed to eat the spermatophore after, it is presumed, it has discharged its contents. Spermatophores do not occur so often in the higher orders. In the Diptera spermatophores are found mainly in the Nematocera, whereas probably all Lepidoptera have them.

Whilst on the subject of Lepidoptera and as most readers will be specialists in this order, the sperm transfer of *Zygaena* will be described (Hewer, 1934). The separation of the egg-laying and copulatory pores common in the Lepidoptera is well exemplified in this species. (see *Fig.* 2). The spermatophore is deposited in the bursa, whence the spermatozoa travel up the *ductus seminalis* to the spermatheca, a process which takes twelve to eighteen hours. The migration of the spermatozoa along the ductus seminalis may be caused by a chemical gradient (chemotaxis). This basically means the spermatozoa seek a region of optimal chemical conditions, in this case the spermatheca. However, contraction of the various ducts (*cf*, *Rhodnius*) occurs in recently mated females.

Another kind of semen transfer not included in spermatophore formation or direct copulation is haemocoelic fertilization. This occurs in Cimicidae and similar forms (Heter-

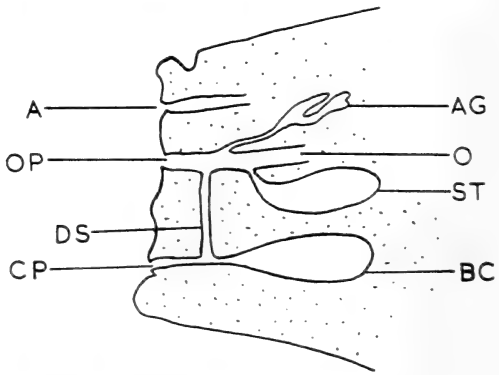

Fig. 2. Female genital tracts in *Zygaena*.
Key: A = anus; AG = accessory glands; BC = bursa copulatrix; CP = copulatory pore; DS = ductus seminalis; O = oviduct; OP = oviductal pore; ST = spermatheca.

optera). In *Cimex lectularius* Linn., a bed bug, the male penetrates the fifth sternite and deposits semen in a special receptive capsule, the Organ of Berlese, or spermalege. The female cuticle and aedeagus of the male are specially modified to effect this process. The spermatozoa are then released into the haemocoel, and next appear in pouches attached to the lateral oviducts. Hinton (1963) lists a series whereby haemocoelic insemination may have evolved from the accidental escape of spermatozoa from the bursa or oviduct to the situation as it occurs in *Cimex*. Probable intermediate stages are described. According to Hinton, the females may receive extra nutrient from the seminal fluid which may help to tide them over between their infrequent meals.

Many other complex and intriguing variations occur in the mating of insects, many of which are described by Davey (1965) and Hinton (1963).

The actual mating is usually accompanied by a complex behavioural ritual in which a male approaches another insect and in essence finds out if it is of the same species, the correct sex, and whether, if all is well so far, she is at the correct state of development for mating. Some insects exhibit monogamy (*i.e.*, mate once), *cf*, the honey-bee and screw worm fly, whereas in others their fecundity is improved by multiple matings.

The transfer of semen in insects is a complex process and has only been described very briefly in this context. However, one or two generalities can be made. The whole process has been evolved to prevent the gametes being desiccated, and there are two main methods which bring this about. Either the male inserts his aedeagus into the female and deposits the sperm in the spermatheca; or a spermatophore is secreted which contains the sperm, and is placed in the female's bursa copulatrix. A modification of the former method involves the penetration of the female's cuticle and the translocation of the spermatozoa to the genital tracts via the haemocoel.

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HORMONES IN INSECTS (PART ONE)

This article is intended as a brief introduction to the study of hormones in insects, with one or two simple experiments which need little or no equipment to illustrate some of the functions and ways of functioning of hormones.

Hormones (or endocrines or endocrine substances) are chemicals which circulate in the body fluids. They are produced from specialised nerve cells ('neurosecretors' producing 'neurosecretion') or from ductless glands in various parts of the body. In the lower animals there are no ductless glands, as far as is known, and it is only when a certain stage in complexity is reached, such as is found in the insects, that the ductless glands are found. The steroids which these glands produce are merely a particular class of chemical substance which need not concern us here. The neurosecretion is probably a protein. The 'chain of command' is simple in concept, and holds for all classes of animals from *Hydra*, a relative of the sea anemones and jellyfish, to ourselves. It may be represented in an

abbreviated form as in *Fig.* 1. The 'target organ' is the organ which is affected by the hormone. A hormone may have one or several target organs, and the accuracy of the 'aim' is determined both by the nature of the hormone and the nature of the target organ: a "square" hormone will fit only a target organ with a "square hole", and will exert no effect on a target organ with a "round hole" (the analogy is purely pictorial, I hasten to add!). The response (every stimulus must have a response) is what the target organ does: it may change its rate of performing a certain process, or start a new one. One could consider the various organs and cells of the insect as the strings on a harp, and the hormones as the fingers of the person playing the harp. The harp will not produce organised sound unless the fingers hit the right notes at the right time. Thus the insect cannot function in an organised manner unless the hormones ensure that the right processes are going on at the right time. A further analogy may be made with the nervous system of the insect, which together with the hormonal system completes the basic short- and long-term controlling systems. The insect cannot move unless the nervous system is telling the right muscles to move at the right time in the right way. Indeed, just as the control of muscles by nerves may be investigated by cutting the nerve and seeing what happens to the muscle, so one can investigate the hormonal system by cutting off the supply of the hormone.

In insects the main hormone producers are the neurosecretory cells which may be found throughout the nervous system in various well-defined areas. Thus there are large and important groups in the front of the brain in the middle where the two halves meet, also further out on the frontal lobes of the brain, and further back in the body of the organ. These are respectively the median and lateral groups of the protocerebrum, and the tritocerebral group. There are also several neurosecretory cells in each of the ganglia (the small swellings from which the nerves come) in the ventral nerve cord. The hormones from these cells control many processes such as growth, moulting, hardening and darkening of the cuticle, egg production and

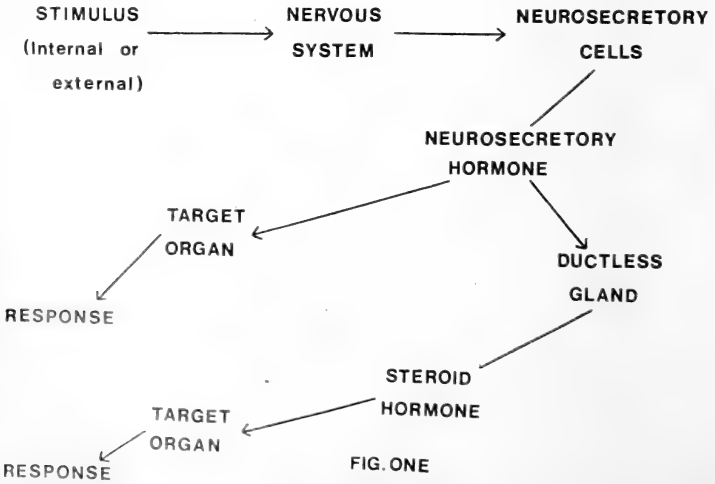

FIG. ONE

formation, water retention or loss, etc.

The neurosecretion of the brain is released through the *corpora cardiaca* (sing. *corpus cardiacum*) of which there are two. The name means 'heart bodies', and these organs are found just behind the brain in the wall of the dorsal 'heart' or aorta. If you want to see these organs, the best and easiest animal to use is probably the cockroach (*Periplaneta* or *Blatta*). Cut the head off at the neck, then cut off one side of the head well to the side so that the cheek, eye and mandible are removed. Then pin the head with the cut side uppermost in a wax-bottomed dish and cover it with a very weak salt solution. You will need also to use a low-powered magnifying glass to look through, and a strong light to illuminate the inside of the head capsule. Then, using a very fine pair of forceps or tweezers and a pin mounted in the end of a matchstick, carefully remove the odd bits of muscle and trachea. You will see the corpora cardiaca as two bluish-white bodies just on top of the gut behind the brain. The bluish white colour is caused by the very fine granules of neurosecretion contained in the cells reflecting and dispersing the light in much the same way that dust particles in the atmosphere make the sky appear blue (the Tyndall effect). On the end of each corpus cardiacum is another gland which is much more transparent, and may even look pinkish. This is the *corpus allatum*. Both the corpus allatum and the corpus cardiacum are supplied with neurosecretion from the median and lateral neurosecretory cells of the brain, but only the corpus cardiacum acts as the main releasing organ for these neurosecretory products. These then affect such processes as ovarian development, fat body metabolism, water metabolism, etc. The hormone which activates the prothoracic glands (see below), the Activation Hormone (AH) is also released from the corpora cardiaca. The corpora allata are noted mainly for the production of Neotenin, the "juvenile hormone", which controls the form of the insect at each moult. Thus it causes either a larva, pupa or adult; or a more adult-like nymph or adult to result. In the adult this same hormone is concerned with the reproductive processes and behaviour in each sex.

Returning to the dissection, if you now take the brain out and look at it top uppermost (*i.e.*, with that part which lies directly beneath the frons uppermost) you might be able to distinguish an area, rather oblong across the join of the two halves of the brain, which is coloured much the same as the corpora cardiaca. This area is where the neurosecretors which supply the corpora cardiaca are situated, and the bluish-white colour is again caused by the finely divided particles of neurosecretion. These median neurosecretory cells are, however, very easily seen in the larva of *Bombyx mori* Linn., and probably in the larvae of other silkmoths. It may be worthwhile looking at the brains of some last instar larvae of various species, to see if you can see these cells. *Fig.* 2 shows the corpora cardiaca and allata of *Blatta*. *Periplaneta* has a similar arrangement, though the glands extend somewhat further back. *Fig.* 3 shows the brain of the silkworm (*Bombyx mori* caterpillar), with two median groups each of four neurosecretory cells.

There remains one major ductless gland: the *prothoracic gland*. This gland, or its equivalent, is also known as the *ventral*, *tentorial*, *pericardial* or *peritracheal* gland in different groups of insects. The function of these glands seems, however, to be the same. Unlike the corpora cardiaca and allata, this gland is not directly connected with the nervous system,

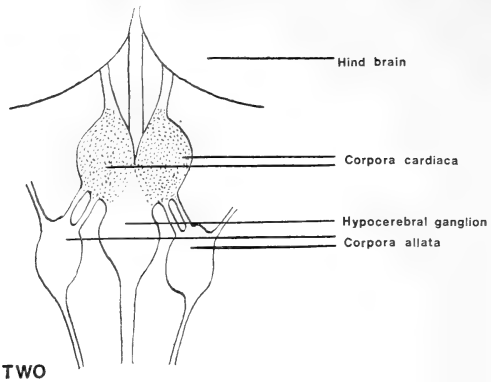

FIG. TWO
Retrocerebral glands of
Blatta orientalis

though it is derived from similar tissues in the embryo. The prothoracic gland is found only in the immature stages of the insect. It produces, under the action of the AH (see above), the moulting hormone, Ecdysone (or Ecdyson) which is concerned mainly with getting the insect's cells to prepare for the next moult. The most obvious effect is on the epidermal cells, which slough off the old cuticle and start to make a new one beneath. Ecdysone has also been shown to have more subtle effects such as altering chemical pathways in various other organs to produce the substances which will subsequently cause the cuticle to harden and darken after the insect has emerged from its old cuticle. It is also responsible for the 'pre-hardening' of cuticular spines and the mandibles before emergence from the old cuticle. Many authors quote Ecdysone as the *growth* and moulting hormone. There is no evidence for Ecdysone having anything to do with growth, so you are one up on the

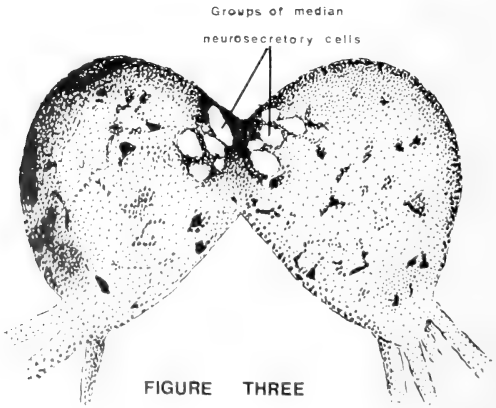

FIGURE THREE
Brain of Bombyx mori caterpillar

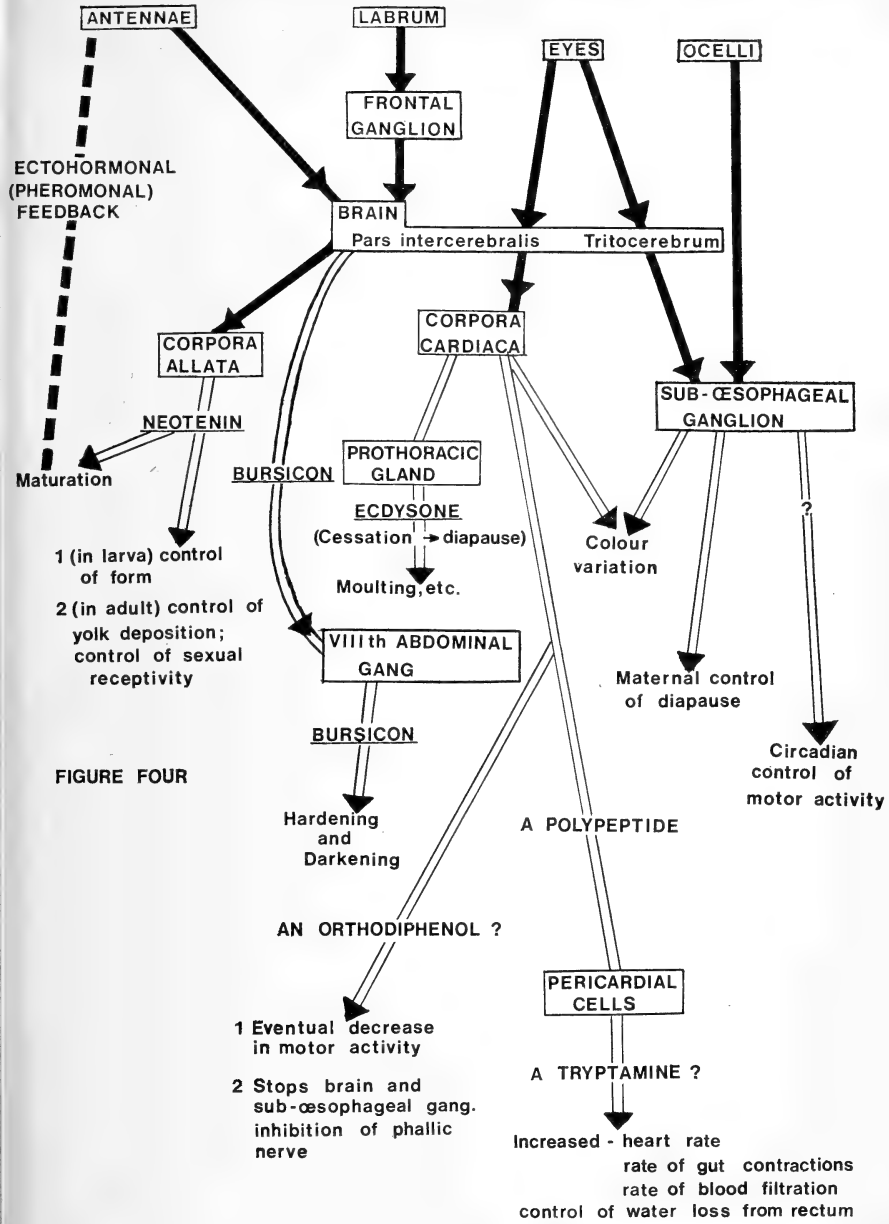

Fig. 4. Diagram of some endocrine effects in the insects.

(Note: The labrum-frontal ganglion-brain pathway leads to the pericardial cell function by way of the corpora cardiaca).

textbooks there!

Well, that's the 'big three' of the glands of internal secretion. But as stated above, there are other neurosecretory cells, together with their corpus cardiacum equivalents, in the ventral nerve cord, though functions have not been assigned to all of them by any means. Some of the cells seem to be associated with the female reproductive cycle; some with conditions of dryness; some show variations in secretory rate in a diurnal cycle. Conversely, a recently discovered hormone, *Bursicon*, has been shown to be produced from the last abdominal ganglion, yet the cells producing the substance have not been isolated. A diuretic ("water releasing") hormone *has* been traced back to the cells which produce it in the last ganglion, but this is an isolated instance.

Fig. 4 shows a selection of the endocrine effects so far discovered. The diagram, as indeed this article, has been abbreviated and simplified quite considerably, and some rather naughty generalisations made. If you want to find out more about insect hormones, V. B. Wigglesworth's '*Principles of Insect Physiology*' will provide a nice generalised account, and V. J. A. Novak's '*Insect Hormones*' will give a much more complex, complete and frustrating account. Frustrating because it is only when you start to investigate in detail and depth that you find out just how little is known, and how uncertain is the basis of all the lovely theories!

In the second half of this article, I will describe some relatively simple experiments which should give food for thought, and also give some idea of how *you* can do some original research into insect hormones.

9.67. J. F. Vincent (3027).

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AN ECOLOGICAL APPROACH TO LIGHT-TRAPPING—5

Weather Relationships

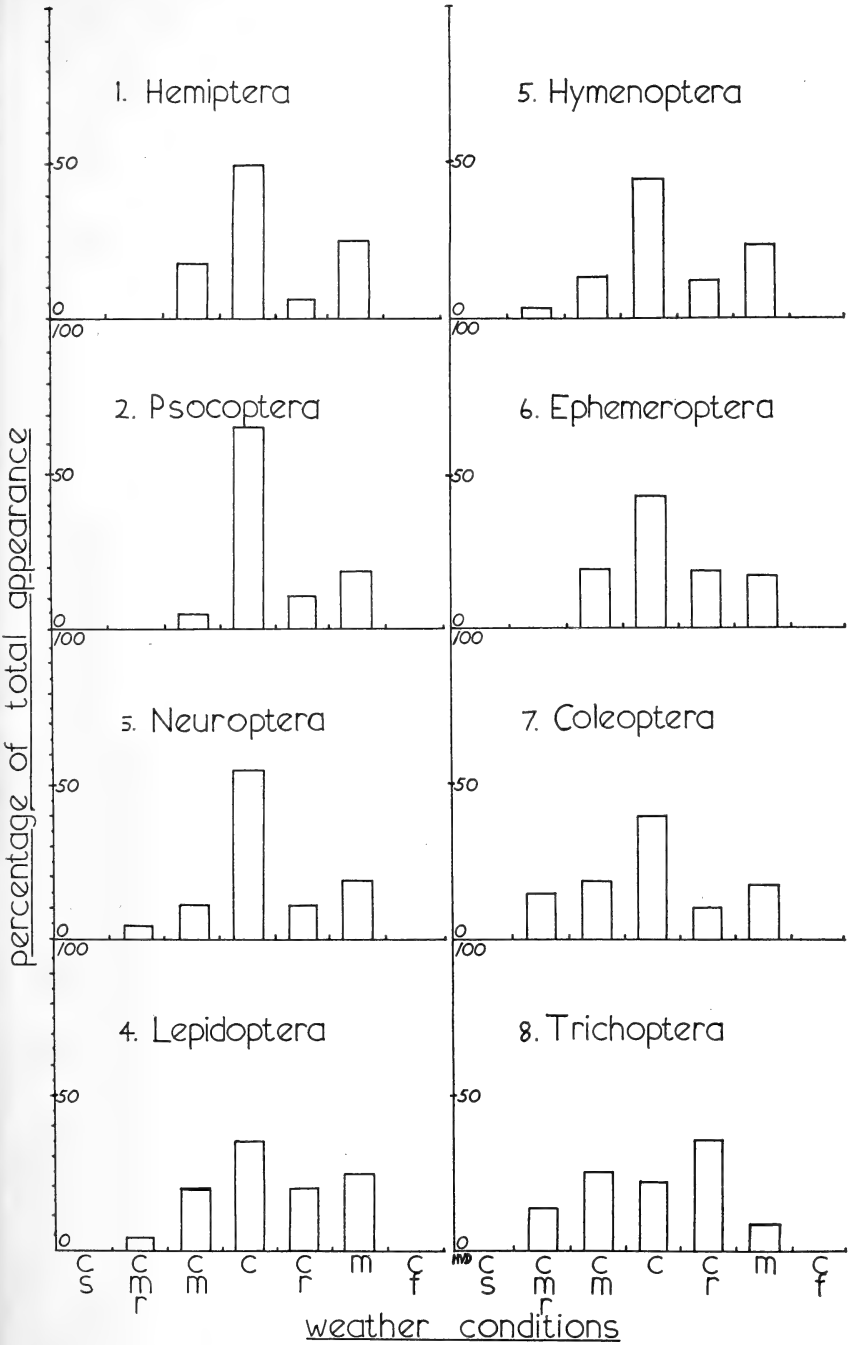
In previous articles (*Bull. amat. Ent. Soc.*, **25:** 29-31, 65-7, 134-5), attempts were made to isolate factors which affected the quantity of insects caught in a light-trap. This section makes no such attempt but tries to give an idea of the overall situation.

Weather conditions, which were recorded simply in terms of either the presence or absence of cloud, rain, snow, fog or moon, were divided into seven distinct categories, as shown on the histograms (*Figs.* 1-8). Since these five terms were accompanied by more important changes in the physical environment a table has been constructed to illustrate them (*Table* 1).

The Orders of insects have been classified into groups (see *Table* 2) according to their reactions to the factors listed. The majority of insects, which have been classified into the first group, preferred to fly on either very cloudy or extremely clear nights. Weather stability, that is the continuation of prevailing conditions, would appear to be important, for far fewer insects flew on moonlit nights interrupted by cloud than would have been expected from the results of the two factors alone.

Group 1b was less definite in its second choice of ideal weather, but this was probably due to insufficient material collected in the samples. First choice was mainly governed by temperature: for instance Psocids, with the highest temperature threshold (*Bull. amat. Ent. Soc.*, **25:** 29), only occurred when there was an effective cloud cover after a hot day.

When stability of the animal environment was disrupted for instance by short intervals of rain, flying activity was drastically reduced. Smaller species of Psocoptera, Ephem-



Figs. 1-8. Appearance of the different Orders in relation to weather conditions.
Key: c = cloud; s = snow; m = moon; r = rain; f = fog.

Factor	cloud	moon	fog	rain	snow
light intensity	—	+	—	—	—
visibility	—	+	—	—	—
temperature	+	0	—	—	—
humidity	+	0	+	+	+
damage	0	0	0	+	+
stability	——→ decrease				

Table 1. Effect of weather conditions on environmental factors.

Group 1a: Hemiptera, Psocoptera, Neuroptera, Lepidoptera, Diptera, Hymenoptera.
1b: Ephemeroptera, Coleoptera.
Group 2: Trichoptera.
Table 2: Groups of insects according to reactions to environmental factors.

eroptera and Hemiptera tended to rest under these conditions, but larger, stronger insects like beetles and caddisflies continued flying, perhaps protected by their specialised cuticle. Both types of insect have produced an effective water-repellant surface, although they have achieved it in entirely different ways. Beetles have the body surface strengthened and streamlined, while caddisflies have their bodies covered with an irregular coat of hairs to prevent water-droplets from adhering.

Any increase in the amount of rain further reduced the number of insects flying, although this did not apply to caddisflies which preferred these conditions. It is interesting that these aquatic insects sometimes have a pattern of behaviour which includes laying eggs below the water-surface, again indicating their indifference to this medium.

Insects were never captured in extremely bad weather such as fog or snow for two principal reasons. Firstly, the visibility especially in fog was reduced to a level below which the light source ceased to be an attraction; and secondly, snow particles caused severe damage to any insects flying.

This latter view is in keeping with the idea of aerial stability. Another factor which tends to reduce stability and obstruct insect flight, but which has not been discussed here, is the presence of wind currents.

The picture obtained, then, is of a temporary environment, the insect population of which is dependent on its stability.

16.8.67. J. S. Badmin (3406).

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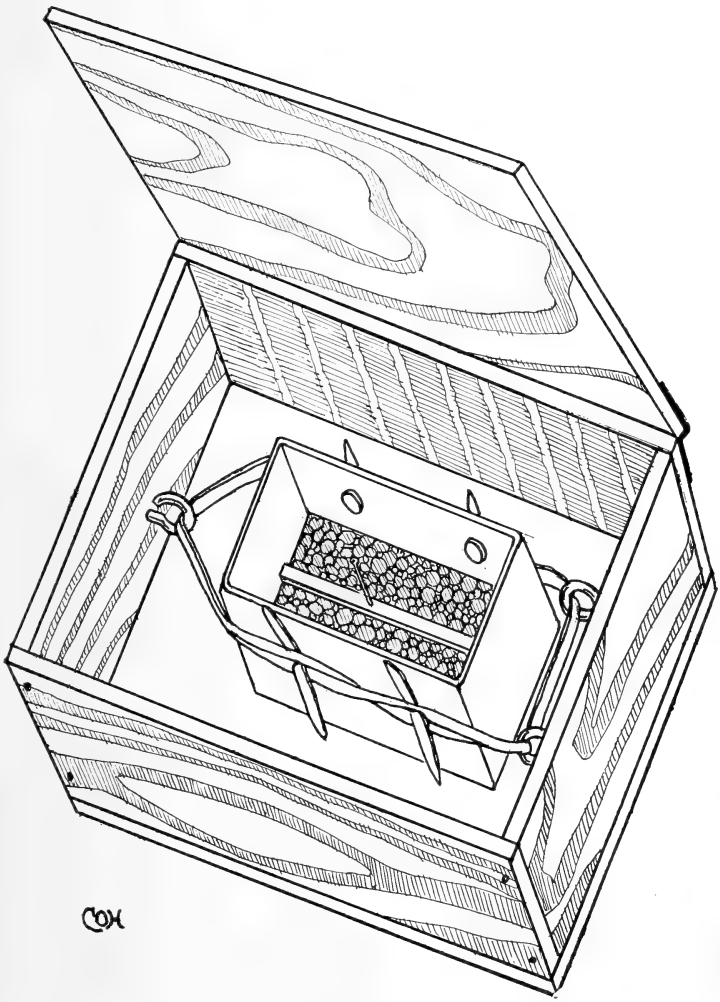
HAMMOND'S BOX

At a recent meeting of the South London Entomological Society, a small box was passed round which had been used for posting delicate specimens. After the box had been thrown in the air several times and caught by clapping loudly between the hands the box was dropped from a height of about three feet on to the bare table in front of the chairman. On opening the box the specimen pinned inside—a syrphid fly, *Volucella pellucens* Linn., caught as long ago as 1932—was found to be still intact. This was made possible by suspending a smaller box inside a larger one, on two rubber bands secured by screw-eyes and long paper fasteners as shown in the figure. The rubber bands should be under slight tension and adjusted by experiment. Mr C. O. Hammond, who made the box, has had it posted forwards and backwards on many occasions without damage to the insects enclosed.



'Hammond's Box'

DISTRIBUTION OF FINNISH INSECTS—1: BUTTERFLIES

Part Two

In this second article on butterfly distribution are included the Families Pieridae, Lycaenidae and Hesperiidae. The scientific names used here adhere to Gullander's system. Reference is made to Part One of this series (*Bull. amat. Ent. Soc.*, **26:** 119-26), in which the distribution zones represented by abbreviations in the lists are shown

on a map of Finland. It is unnecessary to show graphically the south-north decline of numbers of species. Suffice it to say that they follow the general pattern of the families discussed in the first article. A further table is included here to indicate those species which are endemic in Scandinavia, but are not represented in Finland.

Fam. Lycaenidae

	Habitat:	On wing:
Everes argiades Pall.	Rare, in meadows. 2 broods.	Jun-Aug
Cupido minimus Fuessly.	Dry meadows.	May-Jun
Plebejus argus Linn.	Heathlands and pine-bogs.	Jul-Aug
P. idas Linn.	Meadowland.	Jul-Aug
and ssp. *lapponicus* Gerh.	Northern ssp.	
P. optilete Kn.	Pine-bogs.	Jul-Aug
and ssp. *cyparissus* Hb.	Northern ssp.	
Polyommatus icarus Rott.	Meadowland.	Jul-Aug
and ssp. *septentrionalis* Fuchs.	Northern ssp.	
Celastrina argiolus Linn.	Meadows and bushy copses.	May-Jun
Aricia nicias Mg. (=*donzelii* B.)	Localised, open sunny places.	Jul-Aug
ssp. *septentrionalis* Krul.		
A. agestis Schiff. (=*medon* Esp.)	Meadowland. (May be *A. allous* G.-H — P. W. Cribb)	Jun-Jul
Eumedonia chiron Rott.	Meadowland.	Jun-Jul
ssp. *borealis* Whlgr.		
Agriades glandon Prun.	Rare, fells above tree-zone.	Jul-Aug
Cyaniris semiargus Rott.	Meadowland.	Jun-Jul
Lysandra amandus Schn. (=*icarius* Esp.)	Meadows and decid. woods.	Jun-Jul
Philotes vicrama Moore. (=*baton* auct.)	Rare, heathlands and sunny sandy areas with *Thymus serpyllum*.	Jun-Jul
ssp. *schiffermulleri* Hemming.		
Scolitanides orion Pall.	Rocky country.	May-Jun
Glaucopsyche alexis Poda. (=*cyllarus* Rott.)	Meadowland.	Jun-Jul
ssp. *schneideri* Strd.		
Maculinea arion Schiff.	Dry, sunny places with *Thymus serpyllum*.	Jun-Jul
Thecla betulae Linn.	Decid. wood borders, and gardens.	Aug-Sep
T. quercus Linn.	Oak woods, usually high in the trees.	Jul-Aug
Strymonidia pruni Linn.	Wood borders and bushy copses.	Jul-Aug
S. w-album Kb.	Rare, copses and gardens.	Jun-Jul
Callophrys rubi Linn.	Woods and their borders.	May-Jun
and ssp. *nordlandica* Strd.	Northern ssp.	
Palaeochrysophanus hippothoe Linn.	Meadowland.	Jul-Aug
and ssp. *eurydice* Rott.	Sometimes in south.	
ssp. *stieberi* Gerh.	Northern and central ssp.	

Table 4: Distribution in the Lycaenidae.

	A	V	U	SK	Ki	St	SH	SS	LK	SO	NH	NS	NK	MO	Kn	NO	Ks	KemL	EnL	InL
P. optilete	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
P. icarus	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
C. argiolus	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
C. rubi	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
P. hippothoe	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
P. idas	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	?	?
L. helle	–	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
A. agestis	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–
L. phlaeas	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	x	x	x
E. chiron	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	–
P. argus	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	–
C. semiargus	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	x	?	–
H. virgaureae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	x	–	–
L. amandus	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	–	–	–	–	–
T. betulae	x	x	x	x	x	x	x	x	x	–	–	x	–	–	–	–	–	–	–	–
C. minimus	x	x	x	–	x	–	x	x	x	–	–	–	–	–	–	–	–	–	x	–
E. argiades	–	–	x	x	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
T. quercus	x	x	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
S. w-album	–	x	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
G. alexis	–	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	–	–	–	–
A. nicias	x	x	x	x	x	x	x	–	x	–	x	x	x	–	?	–	–	–	–	–
M. arion	–	x	x	x	x	–	x	x	x	–	?	x	x	–	–	–	–	–	–	–
S. pruni	–	x	x	x	x	x	x	x	x	–	–	–	x	–	–	–	–	–	–	–
P. vicrama	–	–	–	x	x	x	x	x	–	–	–	–	x	–	–	–	–	–	–	–
S. orion	–	x	x	x	–	–	x	x	x	–	–	–	–	–	–	–	–	–	–	–
A. glandon	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	x	–
Total in area:	17	23	22	22	21	19	22	21	21	15	16	18	19	15	14	13	10	13	10	7
Total in Lat. block:			25				22				20			15		13		13	10	

Lycaena phlaeas Linn.	Meadows and dry country.	1st:	May-Jun
		2nd:	Jul-Aug
and ssp. *polaris* Courv.	Most common northern form.		
L. helle Schiff.	Damp meadows.		May-Jun
(=*amphidamas* Esp.)			
ssp. *lapponica* Backh.			
Heodes virgaureae Linn.	Meadows and wood borders.		Jul-Aug
and ssp. *oranula* Frr.	Northern ssp.		
Fam. Pieridae			
	Habitat:		On wing:
Aporia crataegi Linn.	Wood borders, and gardens.		Jun-Aug
Pieris brassicae Linn.	Fields and gardens.	1st:	Jun
		2nd:	Aug
P. rapae Linn.	Fields and gardens.	1st:	Jun
		2nd:	Aug
P. napi Linn.	Fields and gardens.	1st:	May-Jun
		2nd:	Jul-Sep
Pontia daplidice Linn.	Occasional; sunny terrain.	1st:	May
		2nd:	Jul
Anthocaris cardamines Linn.	Meadows and fields.		May-Jun
Colias palaeno Linn.	Especially in pine-bogs.		Jun-Jul
and ssp. *lapponica* Stgr.	Northern ssp.	Still active:	Aug
C. nastes Boisd.	Rare, on fell-slopes.		Jun-Jul
ssp. *wernandi* Zett.			
C. hecla Lef.	Rare, on fell-slopes.		Jul-Aug
ssp. *sulitelma* Auriv.			

C. croceus Fourcr.	Occasional southern species.	Aug
C. hyale Linn.	Occasional, meadows and fields.	
	1st:	May-Jun
	2nd:	Aug-Sep
Leptidea sinapis Linn.	Meadows, and wood borders.	
	Usual:	May-Jun
	Occasionally:	Aug-Sep
Gonepteryx rhamni Linn.	Wood borders.	Jul-Sep
	After hibernation:	Spring
Fam. Hesperiidae		
	Habitat:	On wing:
Heteropterus morpheus Pall.	Rare, damp meadows.	Jun-Jul
Carterocephalus palaemon Pall.	Wood borders, lake-beach meadows.	Jun-Jul
ssp. *borealis* Lgbl.		
C. silvius Kn.	Meadows and wood borders.	Jun-Jul
Adopaea lineola Ochs.	Hills and edges of fields.	Jul-Aug.
Ochlodes venata Brem. & Grey	Meadowland.	Jul-Aug
Hesperia comma Linn.	Hilly country.	Jul-Aug
and ssp. *catena* Stgr.	Northern ssp.	
Pyrgus malvae Linn.	Meadows and field edges.	May-Jun
P. centaureae Rbr.	Pine-bogs.	Jun-Jul
P. alveus Hb.	Dry hilly country.	Jul-Aug
P. andromedae Wallengr.	Fells and higher birch forests.	Jun-Jul

Table 5: Distribution in the Pieridae.

	A	>	U	SK	Ki	St	SH	SS	LK	SO	NH	NS	NK	MO	Kn	NO	Ks	KemL	EnL	InL
P. brassicae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
P. rapae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
P. napi	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
C. palaeno	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
G. rhamni	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	x	–	x
A. crataegi	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	–	–
A. cardamines	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	x	–	–
L. sinapis	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	x	–	–
C. hyale	x	x	x	x	x	x	x	x	x	x	x	–	x	–	–	x	–	–	–	–
P. daplidice	–	x	x	x	x	x	x	x	–	–	x	–	–	x	–	–	x	–	–	–
C. croceus	–	x	x	x	–	–	x	–	–	–	–	–	–	–	–	–	–	–	–	–
C. hecla	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	x	x
C. nastes	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	x	–
Total in area:	9	11	11	11	10	10	11	10	9	9	10	8	9	9	8	9	6	7	6	6
Total in Lat. block:			11				11				10				9		10	7	7	

Table 6: Distribution in the Hesperiidae.

	A	>	U	SK	Ki	St	SH	SS	LK	SO	NH	NS	NK	MO	Kn	NO	Ks	KemL	EnL	InL
P. malvae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	–	–
C. silvius	–	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	–	–
O. venata	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	–	–	–	–
P. alveus	x	x	x	x	x	x	x	x	x	x	x	x	x	x	–	–	–	–	–	–
A. lineola	x	x	x	x	x	x	x	x	x	x	x	x	x	–	x	–	–	–	–	–
H. comma	x	x	x	x	x	x	x	x	x	x	–	–	–	x	–	–	–	–	x	–
C. palaemon	–	x	x	–	–	x	x	–	x	x	x	x	x	x	x	x	x	x	–	–
H. morpheus	–	–	x	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
P. centaureae	–	–	x	–	–	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
P. andromedae	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	x	x
Total in area:	5	7	9	6	6	8	8	7	8	8	7	7	7	7	6	4	4	2	3	2
Total in Lat. block:			9				8				8				8		4	2	3	

Table 7. North-European species absent from Finland.

Agapetes galathea Linn.	Denmark.
Hipparchia alcyone Schiff.	
(ssp. *norvegica* Strd.)	Norway
Pyronia tithonus Linn.	Denmark.
Limenitis camilla Linn.	Denmark, south Sweden.
Araschnia levana Linn.	Denmark.
Mellicta parthenoides Kef.	Sweden (?).
M. britomartis Assm.	Sweden.
Nemeobius lucina Linn.	Denmark, Sweden.
Strymon ilicis Esp.	Denmark, Sweden.
Heodes tityrus Poda.	
(ssp. *acrion* Brunn.)	Denmark.
Maculinea alcon Schiff.	Denmark, Sweden.
Lycaeides argyrognomon Bergstr.	Sweden, Norway.
Albulina orbitulus de Prun.	Sweden, Norway.
Lysandra dorylas Schiff.	Denmark, Sweden.
Iphiclides podalirius Linn.	Denmark, Sweden.
Erynnis tages Linn.	Denmark, Sweden, Norway.
Pyrus serratulae Rbr.	Denmark.
P. armoricanus Obth.	Denmark, Sweden.
Adopaea flava Brunnich	Denmark.

Some considerations

Plotting the distribution, range, or dispersal, etc., of species of insects can be a fairly straightforward task. We need arm ourselves only with some instrument by means of which to capture specimens of interest, with enough information to be sure of identification, and with a map and a notebook to enable us to record our finds. Immature stages are recorded in the same way as the adults, whilst a certain proportion of the adult catch is generally retained for reference purposes.

Having set about the study in this way, we have gained, over some years, a certain knowledge of insect distribution. The fact that we also collect specimens simply because we enjoy collecting them is a matter for the psychologists. It is only likely to be of consequence to those of similar interests if we set off once yearly for the British haunts of such insects as the Large Blue Butterfly (*Maculinea arion* Linn.), in the form of a 'vacuum-cleaner in entomologist's clothing'. We do not do this, of course, if we also like insects.

Work of the kind mentioned in the first paragraph is extremely useful. Without the notebooks of amateurs, textbooks would involve their authors in years of intense study over an almost impossibly vast area, and would probably be thus prohibitively priced. As it is, an amateur is able to devote his spare time to making an intensive, personal study of a restricted area, often over two or three decades. The result of this field-work is a knowledge of the following aspects of the biology of each species studied:

a. Its distribution within a certain area—usually representing only a part of its total range.
b. the sub-habitats in which its life-cycle is enacted.
c. the dates of its appearance in its various stages.

Perhaps inadvertently, an insight is also gained into the following:

d. The distribution of the foodplants (or other food material) of the growing stage.
e. the distribution of the food-sources of the imago.
f. terrain preference differences in allied, and in distantly related, forms.
g. the influence of the weather, and of light-values, on activity (see,

e.g., Badmin, in *Bull. amat. Ent. Soc.* **24:** 23-4, etc.)

This is the sort of knowledge I spent several years gathering in the British Isles.

On my entering new pastures in which there are few entomologists, however, it was clear that my distributional studies would have to extend deeper than hitherto if I was to make a serious attempt at providing some solutions to the many queries which have been the end-points of previous research in other parts of the globe.

I chose to begin this series of articles with the butterflies for several reasons, not the least of which, I confess, was my own interest in them. The first stage of the work has been completed, and is presented in these two articles. It consisted in obtaining copies of the recent textbooks and extracting from them the details of the broad distribution (over some 325,000 sq. km. of land surface) of butterfly species. In the process of doing this, three problems presented themselves to me.

Firstly, Finland, unlike Britain, is not conveniently surrounded by a natural 'fence', the sea, which probably forms a barrier to the dispersal of the majority of insect species in the British Isles. Finland adjoins the U.S.S.R. to the east, Norway to the north, and Sweden partly along the western side. The marine waters of the Gulf of Bothnia and the Gulf of Finland form only a partial barrier to dispersal, this being continuous on the western, south-western and southern sides. Ahvenanmaa and its associated islands, although surrounded by water, do share a number of species with the southern part of the mainland.

Secondly, the information imparted in the most recent work of national importance (Gullander, 1959) is not really so up-to-date as one would like it to be.

Thirdly, I have yet to discover the basis for the division into the so-called "Natural historical areas of Finland" (see map, *Bull. amat. Ent. Soc.* **26:** 120). They do not correspond to the published climatic, geological or vegetational patterns; neither do they relate exactly to rural communes. Again, these areas are of varying sizes and are all too large to be of any great use as actual distribution indicators. Each species is simply recorded as being either present in, or absent from, each area. The notes given by Gullander on habitat preferences, however, enable one to narrow down the areas to a certain extent. Unfortunately, the cost of buying a complete set of the local 1:20,000 maps would be very high, and it is only on these maps that individual forest and swamp types, lakes, altitude, agricultural areas, and so on, are marked.

It is necessary that I should gather further information in order to be able to represent specific ranges by a series of dots, rather than by a smaller number of "covering" areas of great expanse. I am working through the periodicals indicated under 'references' as well as covering as large an area as possible during my field activities this season.

Whilst it is a fairly easy task to build up in this way a comprehensive set of specific distribution charts, it is by no means so easy to isolate the factors which actually govern ranges. This isolation is rendered even more difficult in that, even foodplant distinctions aside, the spread of butterfly species appears to be influenced, not by a single factor or combination of factor values, but by more or less exclusive combinations acting on each species. It is thus essential that a thorough study be made of all possible factors. This means going somewhat further than the limits of the investigations briefly enumerated in the opening paragraph. It entails,

for example, making careful studies of larval foodplants and of other vegetational entities, correlating their dispersal with those of the butterflies. Here again, published facts do not meet our requirements. A comparison between the distribution of the Finnish species of Satyridae and that of the larval foodplants, using published matter, showed that the plants in almost every case had been recorded as residents of places in which the insects are not known to occur.

I hope that something will come of this project because I feel that, having decided that insect species are adapted to their environments, we all ought to try to contribute something towards finding out what factors are instrumental in preventing each species from widening its range. Only when this information has been obtained can those whose task it is to implement conservation projects in Britain be suitably armed.

Talk of conservation in Britain, one may feel, is out of place in an article purporting to throw some light on the distribution of butterflies in Finland. I feel that they are both part of the same sphere. Members read the Bulletin because they are interested in entomology, and I believe that conservation is of major importance to those who like insects and who also gain great pleasure from collecting them.

8.5.67. Leigh Plester (2968).

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BUTTERFLIES IN FRANCE AND SPAIN AUGUST-SEPTEMBER 1966

Last summer my wife and I spent a three weeks' camping holiday in south-western France and northern Spain. Although this was not primarily a 'butterflying' trip, my wife's tolerance enabled me to do a fair amount of collecting.

We had no fixed plans but intended to end up on the Costa Brava, although we were in no particular hurry to get there. Leaving Newhaven early on the morning of 20th August we arrived at Dieppe at about lunch time. Having passed through customs we set off southwards stopping for tea just north of Blois. Here I unpacked my net for the first time. In some scrub land and long grass beside the road I found *Arethusana arethusa* D and S and *Lysandra coridon* Poda (Chalkhill Blue) to be common. I was pleasantly surprised to take four *L. coridon* var. *syngrapha* Kef. in about five minutes. I also took a couple of *Colias hyale* Linn. (Pale Clouded Yellow). Naturally I was very pleased with this excellent start to the holiday.

We spent the night just south of Chateauroux, being then on the N20 which we subsequently followed right to Andorra. Early next morning we ran into quite thick fog which did not clear for some time. By midday we were just north of Cahors and decided to stop for lunch. I had a look round, again *L. coridon* was common and much to my amazement I caught a further five var. *syngrapha*. I do not know if this var. is very much more common in France or whether I just picked two lucky sites. Small fritillaries abounded and I noted five different species in one small field, namely *Melitaea didyma* Esp., *Melitaea phoebe* Schiff., *Mellicta deione* Gr.,

Mellicta parthenoides Kef., and *Clossiana dia* Linn. I also caught a very nice abberation of *M. deione*. *Hesperia comma* Linn. (Silver Spotted Skipper) was quite numerous.

We continued south that afternoon spending the night just outside Aix-les-Thermes almost at the foot of the Pyrenees. Next morning while we waited for the dew on the tent to dry before striking camp I saw a number of *Brintesia circe* Fab. and took a specimen of *Hipparchia alcyone* Schiff.

As we drove through Aix-les-Thermes we were surprised to see a number of people with their feet in what looked like a large paddling pool in the main square. What amazed us most was the steam rising from the water. The significance of the name of the place then dawned on us and we realized that this must have been hot water from a natural spring.

The road up the mountain was very impressive. We traversed back and forth and always upward, and some of the views were quite breathtaking. The road signs warning against '*Troupeaux*' were fully justified. The big tawny cows, heaven knows what breed, just stood in the road while the line of cars and lorries had to weave its way between them.

Having passed through the customs and filled up with petrol at the battery of pumps right at the top of the pass, petrol in Andorra being almost a gift after the high French prices, we stopped to admire the view down into Andorra and to give the car a breather—to say nothing of the driver. A number of smallish brown butterflies were sighted and amongst them some that looked almost purple. These proved to be all the same species, *Erebia cassioides* Hohenwarth., at first sight rather a dull butterfly but at certain angles the wings have a beautiful purplish sheen.

We stopped for lunch in Andorra. *Polyommatus icarus* Rott. (Common Blue), *L. coridon* and *Aglais urticae* Linn. (Small Tortoiseshell) were common. I also saw a couple of specimens of *Lysandra bellargus* Rott. (Adonis Blue) and one rather battered *Mesoacidalia charlotta* Haw. (Dark Green Fritillary).

On leaving Andorra we decided not to drive straight to the Costa Brava but to see a bit more of Spain first. Instead of driving westward to Puigecerda we therefore set off southwards on the main road to Lerida. After some fifty kilometres we took a more minor road going east. While stopping for tea beside a small stream (Ribera Salada) I caught a nice specimen of *Limenitis anonyma* Lewin and a couple of *Everes argiades* Pall. (Short-tailed Blue).

We camped for the night by the Rio Cardonna just outside the town of the same name. It was a poor spot for butterflies, although there were a few *Lysandra hispana* H.-S. about, so I tried my hand with a fly rod. I did not raise a thing and in fact saw no sign of fish at all in the very fast water of the river.

Next morning we packed up again and moved on through Suria and Belsareny. I am giving the names of the towns so that readers with suitable maps can plot our progress.

The weather was beautiful and after a few brief stops to pick blackberries my wife and I decided we had had enough of the car for a bit and that we should make the best of the sunshine. Naturally I made sure that we stopped in what looked like a good place for butterflies. The country was hilly and wooded with clearings and small terraced fields. Even before we had stopped the car I had spotted vast numbers of *Leptidea sinapis* Linn. (Wood White), which

were literally everywhere flitting between the trees and in the small fields. I have never seen so many anywhere before. I took those I wanted by simply netting those that came within range while I sat in the sun eating my sandwiches. Fritillaries were common in the fields and I saw *M. didyma*, *M. phoebe*, *M. deione* and *C. dia*, and also a couple of specimens of *Issoria lathonia* Linn. (Queen of Spain Fritillary).

'Blues' were also numerous, mainly *L. hispana* and *P. icarus* but I also saw one *Lampides boeticus* Linn. (Long-tailed Blue) and took two female *Agrodiaetus damon* Schiff. *Erynnis tages* Linn. (Dingy Skipper) was quite numerous. *Colias australis* Verity (New Clouded Yellow) and *C. croceus* Fourcr. (Clouded Yellow) were also taken.

By mid afternoon we had set off again, having driven through Vich we took the road to San Hilario. We soon found ourselves climbing up and up once more. The road was literally cut into the side of the mountain and the drop at the edge was rather alarming, especially as the road was not very wide and we were constantly expecting a large lorry to come tearing round the corner in front of us. A number did but fortunately we managed to squeeze by on each occasion. Having reached the top the terrain levelled off a bit and the downward road was nothing like so steep or spectacular. We drove through a delightful open valley and decided to stop for the night.

Next morning we found our surroundings so attractive that we agreed to stay for the day. There were a number of very worn *Argynnis paphia* Linn. (Silver-washed Fritillary) and *Fabriciana adippe* Rott. (High Brown Fritillary) about and *Vanessa cardui* Linn. was also quite common. I saw a couple of rather battered specimens of *Agapetes lachesis* Huebn. and also a couple of *Hipparchia semele* Linn. (Grayling).

'Blues' were not numerous but I took specimens of three skippers, *Pyrgus cirsii* Rambur, the smaller *Spialia sertorius* Hoffmansegg., and *H. comma* Linn. I also took one *Papilio machaon* Linn. (Swallowtail) and one *Iphiclides feisthameli* Dup., the only Papilionids I came across during the holiday.

Next morning the weather was cloudy and threatening rain so we moved on to the coast. Going via San Hilario, Gerona and Parafrugell to Tamariu, we arrived about midday and set up camp. We spent two and a half days in Tamariu. Except for one sunny morning the weather was cloudy and we had two mammoth thunderstorms. I did not do much collecting, except on the sunny morning. *M. didyma* and *M. deione* were quite numerous as were the 'Blues' *Syntarucus pirithous* Linn. and *P. icarus*, I also saw a few specimens of *L. boeticus* and took a couple of the skipper *Carcharodus alceae* Esp. and one of *Gegenes nostrodamus* Fab. *C. croceus* and *Pararge aegeria* Linn. were common and *Hipparchia fagi* Scop. were quite numerous.

As the weather was still bad on the third day we decided to leave. Neither of us had previously been to the Atlantic coast so we thought we would work our way across. After studying the map it appeared that the roads in France were better than the Spanish ones, so we set off to recross the Pyrenees. This time we went by the more direct route Gerona, Banolas, Olot, Ripoll and Puigcerda, nothing like so attractive as the way we had come but much quicker.

When we crossed into France we did not take the N20, but the N16 to Mont Louis and then the N118 to find a large lake which we had spotted on the map as a potential camping place. We arrived as dusk was falling and

pitched our tent right beside the lake which turned out to be a huge reservoir.

Despite the fact that we were at more than 5,000 feet the next day was hot. *Erebia neoridas* Boisd. was very common and I also caught a few specimens of the copper *Heodes virgaureae* Linn. and one *I. lathonia*. That evening the clouds came down over the mountains and completely enveloped us. Next morning dawned sunny but it was very much colder. By mid morning however dark clouds had begun to gather and by lunch time it had started to rain a hard, cold, driving rain that looked as if it had set in for the day. We therefore struck camp and set off to descend the Pyrenees on the French side.

Coming out of the mountains at Axat we travelled westwards stopping for the night at Foix, a most attractive town. Next morning was still wet and we continued through Tarbes, Pau and Bayonne. By the time we had reached the Atlantic the weather had begun to clear but the sea was very rough and bathing was forbidden on all the beaches we could find. By now it was getting late so we took a side road inland to find somewhere to camp for the night.

The following day dawned clear and sunny. It was 1st September and we only had nine days of our three weeks to go. On studying the map we found that we were very near the Spanish border. A quick count down on our finances persuaded us that back into Spain was the place for us. We could have almost two days in Spain for the price of one in France, or so my wife informed me. We crossed the border at a tiny frontier post on a little back road feeling very mean as we had to get the single Spanish guard away from his breakfast and he had to chase the chickens away in order to lift the barrier.

Once in Spain the road dropped sharply and we arrived at the delightful little town of Vera. From here we headed towards Irun and the coast, the road following the river Bidasoa most of the way. It was while we stopped briefly on the river bank that I took a specimen of *Araschnia levana* Linn. This may be a very interesting capture as I see that R. F. Bretherton (1966) in his 'Distribution List of the Butterflies of Western and Southern Europe' while referring to this species says it is "not yet certainly known from Spain". This specimen was certainly taken in Spain, although only just.

We drove through Irun and the smaller Fuenterrabia and out on to the cliff top. Having found a secluded spot to camp in the pine trees, we were so enchanted by the sea, cliffs and the little beaches that we spent the next four days here. Except for one day when we visited San Sebastian, the weather was good. While my wife sunbathed I did quite a lot of 'butterflying' along the cliffs. The 'Blues' were the most numerous, and of these *Everes argiades* was very common and I took one specimen of *E. alsetas* flying with it. *L. boeticus* was also quite numerous as was *P. icarus*. A number of other species were common especially *C. croceus*, *Maniola jurtina* Linn. (Meadow Brown) and *E. tages*. I was pleased to take a few specimens of that attractive satyrid *Minois dryas* Scop. which must have been pretty well at the edge of its range. I also found the small dark copper *Heodes tityrus* Poda and took a single specimen of *Pararge maera* Linn. In addition *Vanessa atalanta* Linn. (Red Admiral) and *Inachis io* Linn. (Peacock) were seen.

Starting on our way home we spent two days on the coast north of Bayonne between Hossegor and Vieux-Boucau—not a good place for butterflies, being mainly sand and pine trees. *L. boeticus* was, however,

very numerous.

We spent our last day in France in the Loire valley. Then it was back to England until next year's summer holiday.

16.1.67. M. J. Perceval (3798).

REFERENCE

BRETHERTON, R. F. (1966). *Trans. Soc. Brit. Ent.*, **17**: 1-94. A Distribution List of the Butterflies (Rhopalocera) of Western and Southern Europe.

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JUNIOR NEWS SECTION

I expect you will be reading this while the winter snows blot out all memories of last summer's sun and the pleasures of insect treasure hunts.

Have you planned anything special for next season? I always find that planning my summer expeditions makes the bad weather of winter give way to the bad weather of summer much quicker.

I had very interesting accounts of last Whitsun's Teen International Entomology Group New Forest camp organised by Rob Dransfield (3492J). near Brockenhurst, Hampshire. The group was able to find many of the insects they wanted and by camping had the great advantage over Youth Hostelling (which I prefer) in that they were able to collect moths at night. The camp site unfortunately proved to be a little boggy but this was compensated for by everyone having a jolly good time and a successful trip to the Isle of Wight in search of the Glanville Fritillary (*Melitaea cinxia* Linn.). A further Teen International camp was arranged during July where one of the interesting insects caught was said to be the rare *pallida* variety of the Small Skipper (*Thymelicus sylvestris* Poda).

On 7th August Rob Dransfield and council member Ron Allen, of 26 Burnside Road, Dagenham, Essex, set off for a cycling expedition from Dieppe to eventually reach the Ardennes on the east Belgian border. They reached Aunale at about 12 o'clock, on a—by then—fine sunny day and found one field there where butterflies abounded. There were Pale Clouded Yellow (*Colias hyale* Linn.) and Chalkhill Blues (*Lysandra coridon* Poda) as well as other 'Blues', Skippers and commoner species like the Brimstone (*Gonepteryx rhamni* Linn.).

After camping at Amiens the explorers pressed on into the Valley of the Somme where flies were plentiful but very few interesting Lepidoptera apart from a large unidentified Nymphalid which managed to duck the net, and a dwarf (?) Green-veined White (*Pieris napi* Linn.). Further on near Estrees a clover field was found covered with Clouded Yellows (*Colias croceus* Fourcr.) and Peacocks (*Nymphalis io* Linn.). The night was spent in the barn of a very understanding farmer just outside Homblieres, near St Quentin. (Why doesn't school French match that they speak in France?)

On Wednesday, heading for Eteigneres, our friends found quite large numbers of butterflies and flies on the umbellifers. Of particular interest was the European Map Butterfly (*Araschnia levana* Linn.), which at first glance looked very much like the White Admiral (*Limenitis camilla* Linn.).

After having met light rain the duo became drenched as they ran into violent thunderstorms in the Meuse valley. The weather did not really improve when they finally made camp just north of Revin in the Ardennes.

Rob caught two further species of 'Copper' and several Fox Moth larvae (*Macrothylacia rubi* Linn.). The 13th was his lucky day when near

Hautes Buttes in the mountains he netted a perfect specimen of the Camberwell Beauty (*Nymphalis antiopa* Linn.) as well as finding a field full of 'Coppers' and a single Pearl-bordered Fritillary (*Argynnis selene* Schiff.). On the same day in an orchard near Montherme he caught a continental Wall Butterfly (*Pararge* sp.). At night the flowers surrounding the camp site held large numbers of Noctuid moths. One sweep brought in eight or nine at a time.

On the 15th, on the return to Amiens, the first Swallowtail (*Papilio machaon* Linn.) was seen but not taken. The two boys split up at Amiens and Rob turned towards Paris for a spot of sightseeing. On the way he did manage to catch a rather battered male Swallowtail and later a female which laid only two eggs. He just missed catching a Long-tailed Blue (*Lampides boeticus* Linn.).

On the way back to Dieppe the weather was glorious and although it was by now rather late in the season large numbers of 'Blues' were seen on a hill near Meulon including the Silver-Studded Blue (*Plebeius argus* Linn.), the Small Blue (*Cupido minimus* Fuessl.) and a few Adonis Blues (*Lysandra bellargus* Rott.). A field further on also proved to be filled with 'Blues' and Clouded Yellows including the light var. *helice* variety. These together with the Pale Clouded Yellow were abundant everywhere. The only different species encountered on the way back to the coast was the Holly Blue (*Celastrina argiolus* Linn.)—on, believe it or not, Holly (*Ilex aquifolium* Linn.).

Rob concludes by saying that it was most noticeable how similar the species around Paris are to ours at the same time of the year while a totally different group was found in the Ardenne mountains. His only other comment was on the roads of Northern France. They are not made for the cyclist, even if he did have a most enjoyable holiday.

I have been so long talking about collecting in the summer sun of northern France that I almost forgot to congratulate those of you who did so much to make last year's AES Annual Exhibition such a wonderful success. There were so many really good exhibits. It was most difficult for the Council members to choose those which deserved special prizes. These went eventually to A. Lucas (3934J) for his "Survey of Happy Valley", and to D. V. Lewis (3963J) for his "Common Moths of North Wales". I was glad I did not have to choose.

Two organised groups put on a good show: the Teen International and the Silkmoth Rearers' Group.

I was particularly pleased to see Miss Barbara Brent exhibit "British Moths". It's time more girls came forward to show the boys they can also take an intelligent interest in Natural History.

I also found the joint venture which M. S. Collins (3975J) helped to produce—"A family tree of Coleoptera"—very refreshing. (Anyone would think that butterflies were the only insects in the world. I like beetles myself).

If any of you live within striking distance of St Ives, Huntingdon, and have difficulty in getting to the AES Exhibition why not get in touch with St Ivo School. You could come with us.

I really must come to an end pretty soon as we are short of time and space. I did just wonder how many of you are helping with the recording of common insects for the Nature Conservancy. They need records of butterflies, moths, dragonflies, grasshoppers, weevils and even spiders. If you can't help with the records—help by not over-collecting.

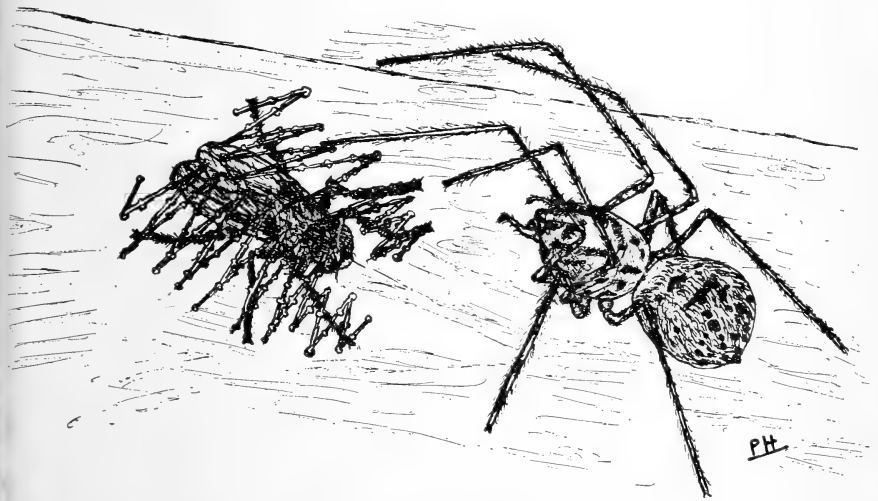
By the way, can anybody help me

with the whereabouts of some of these animals. Do you find the Gum-spitting Spider (*Scytodes thoracica* Latr.) roaming the walls of your house? It is quite small (about a quarter of an inch in length) and beige and black in colour. It does not use silk to catch its prey, but shoots gum very accurately at flies and other insects which settle too close. Another spider I would like to hear about is the very rare black and scarlet *Eresus niger* Petana. Are they as rare as people say? Does anyone know of Stag Beetles (*Lucanus cervus* Linn.) being found north of the Thames valley or of Swallowtail Butterflies anywhere but Norfolk (I do not want the exact spot)?

Early records will be welcome this year.

Very best wishes for the New Year.

H. J. Berman, F.R.E.S. (2941A).



The Gum-spitting Spider (*Scytodes thoracica* Latr.)

NOTES AND OBSERVATIONS

GNATS WITH AN ANTENNA FOR MUSIC

Quite often, while perusing literature outside my own immediate spheres of study, I discover an item which interests me not simply as another piece of scientific knowledge, but rather as a novel piece of information easily recalled to mind for a long time afterwards.

Such an item appears in *Annales Zoologici Fennici* (1966), in which Jaakko Syrjamaki reports his observations on dusk-swarming in *Chironomus pseudothummi* Strenzke. These observations were made at the Lammi Biological Station, South Finland (61° 03′ N; 25° 03′ E.), during the late summer of 1965.

"One evening, when watching the swarm, I began to hum a Finnish folk-song. As I hummed the first note, the whole swarm abruptly moved down and the nearest swarmers flew very vigorously to the vicinity of my mouth. This led me to stop humming, whereupon the males immediately returned to the swarm. The tone sung proved to be g (*i.e.*,

about 200 vibrations per second) as determined with the aid of a pianoforte in the nearby home of the janitor of the Station."

I would be interested to know whether any of our Members have met with similar experiences in the field. Syrjamaki records that the phenomenon has been observed before (Nielsen and Grieve, 1950), but as neither of these observations was made in Britain, if one of our Dipterists is sufficiently interested, he could perhaps perform some original work in the field using, for example, a set of tuning forks. It might then be possible to discover what vibrations attract the males of the various British species, hence to contribute to the knowledge respecting mate-attraction in the females.

22.4.67. Leigh Plester (2968).

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SYRJAMAKI, J. (1966). *Annales Zoologici Fennici*, **3** (1): 20-8. Dusk swarming of *Chironomus pseudothummi* Strenzke. (Dipt., Chironomidae).

NIELSEN, E. T. and GRIEVE, H. (1950). *Bull. Entom. Res.*, **41**: 227-58. Studies on the swarming habits of mosquitoes and other Nematocera.

●

THE CLOUDED YELLOW IN SUSSEX

In mid-August 1967, three specimens of *Colias croceus* Fourcr. (Clouded Yellow Butterfly) visited my garden here at Bexhill-on-sea, Sussex. They were seen on several days, and one was an absolutely perfect specimen, though I did not take it.

16.10.67. G. B. Hodges (314).

●

UNUSUAL FOODPLANTS FOR THE ELEPHANT HAWKMOTH

In 1963, I bred a large number of larvae of the Elephant Hawkmoth (*Deilephila elpenor* Linn.), and experimented with different foodplants. To my great surprise, I found the larvae devouring not only the leaves but also the succulent stems of the Policeman's Helmet (*Impatiens glandulifera* Royle) and the Orange Balsam (*I. capensis* Meerburgh) with great relish. These plants belong to the family Balsaminaceae, very far removed from the various plants in the family Onagraceae (willow-herbs, etc.) with which one usually associates this species.

28.8.67. Brian Wurzell (3718).

[Mr P. W. Cribb reports finding this species on Orange Balsam in the wild in Middlesex.—*Ed.*]

●

THE GLOW-WORM IN KENT

Recently I heard that as this insect seems to be decreasing in numbers recent records were of special interest. In June 1967, I found Glow-worms (*Lampyris noctiluca* Linn.) to be quite frequent in the Weald of Kent, just south of Knole Park, Sevenoaks. Any half an hour's walk after dark would certainly reveal two or three females on pathsides and verges, while males regularly came to electric lights, presumably confusing artificial light with the sexually-inviting light of the female. Perhaps the female's light renders her far more vulnerable to nocturnal predators, not to mention collectors, or even passers-by who cannot resist handling, or displaying to their friends, objects of unique interest. More publicity about the precarious status of the Glow-

worm could do no harm.
28.8.67. Brian Wurzell (3718).

●

THE DEATH'S HEAD HAWKMOTH IN BEDFORDSHIRE

On August 2nd this year (1967) I was given a caterpillar of the Death's Head Hawkmoth (*Acherontia atropos* Linn.) which was found near some potato plants in an allotment at Bedford. It was ready to pupate and when it was put in a container filled with bulb fibre it soon burrowed out of sight. The following day another one was found by a friend of mine near where the first was discovered. These caterpillars are the first of their species to be recorded in Bedfordshire since 1956.

Terence F. Knight (3190).

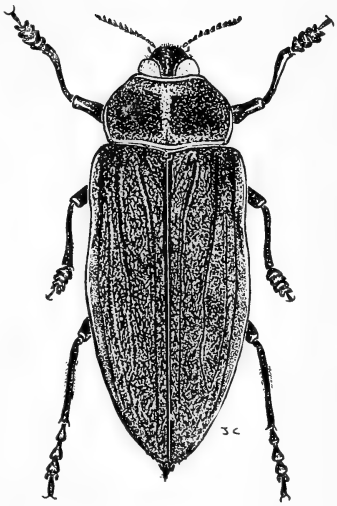
●

THE SILVER-STRIPED HAWKMOTH IN BUCKINGHAMSHIRE

In the *Bulletin* of May 1967 (*Bull amat. Ent. Soc.*, **26:** 65) Mr N. Cook enquires whether anyone else has taken *Hippotion celerio* Linn. (Silver-striped Hawkmoth) in 1966. That year was not a good one for the larger immigrant Hawkmoths, but one or two *H. celerio* were taken in the late autumn, though not in Buckinghamshire. The species is not included in the Victoria County History (Part 3, Zoology) published in 1905, and there does not appear to be any other record of its occurrence in the county.

Sir Eric Ansorge, C.S.I., C.I.E., F.R.E.S. (2508).

EUCHROMA GOLIATH CAST. AND GORY



Euchroma goliath Cast.& Gory.

A large metallic Buprestid found in South Mexico, Central America, Northern South America and in the islands of Jamaica and Granada in the West Indies.

It is a well built insect with the elytra deeply sculptured and punc-

tured. The legs, head, and thorax except the disc, are covered in sparse coarse pubescence. The entire beetle is highly metallic deep copper-red and green.

A reference to its biology can be found in a paper published by G. Bondar in *Correio-agricola* in 1926 (unobtainable at the British Museum (Natural History)).

I can see no reason why *E. goliath* cannot occur in the islands between Jamaica and Granada, and Granada, Trinidad and Tobago to the mainland of South America.

I would like to thank Mr B. Levey of the British Museum, Natural History for identifying and supplying the information about the beetle.

7.8.67. Jonathan Cooter (3290).

REFERENCE

BONDAR, G. (1926). *Correio-agricola*, **4**: 192-3. A biologia do *Euchroma gigantea* L.

●

ANNUAL GENERAL MEETING

The Annual General Meeting will be held on 23rd March 1968 at the rooms of the Linnaean Society, Burlington House, Piccadilly, London, W.1. Further details will be circulated to members before the meeting.

REMINDER—WHERE TO WRITE

It helps the Society greatly if Members ensure that their correspondence is addressed to the correct Officers of the Society, by using the 'where to write' panel in the most recent *Bulletin*. At present the correct addresses are as follows:

Membership applications and first subscriptions to:	D. E. Dodwell, 28 *Summerleaze Park, Yeovil, Somerset. Yeovil* 3928.
Changes of address and non-arrival of Bulletins to:	P. Taylor, 18 *Old Manor Drive, Isleworth, Middlesex.*
Advertisers and for Prospectus of Society and Application forms to:	R. D. Hilliard, 18 *Golf Close, Stanmore, Middlesex. GRImsdyke* 0460.
Offers to lead field meetings, etc. to:	C. B. Pratt, 1 *West Ham Lane, London, E.15*
Manuscripts, drawings and books for review to:	H. V. Danks, *Imperial College Field Station, Silwood Park, Sunninghill, Ascot, Berkshire.*
Subscription renewals (25/- per annum, 12/6 under 18 years) to:	B. R. Stallwood, 17 *Claremont Avenue, Sunbury-on-Thames, Middlesex. Sunbury* 2687.
Youth matters to:	H. J. Berman, *St Ivo School, St Ives, Hunts.*
Offers of help, queries, etc. to:	P. W. Cribb, 355 *Hounslow Road, Hanworth, Feltham, Middlesex. FELtham* 3099.
Annual exhibition matters to:	B. F. Skinner, 85 *Elder Road, West Norwood, London, S.E.27. GIPsy Hill* 0057.

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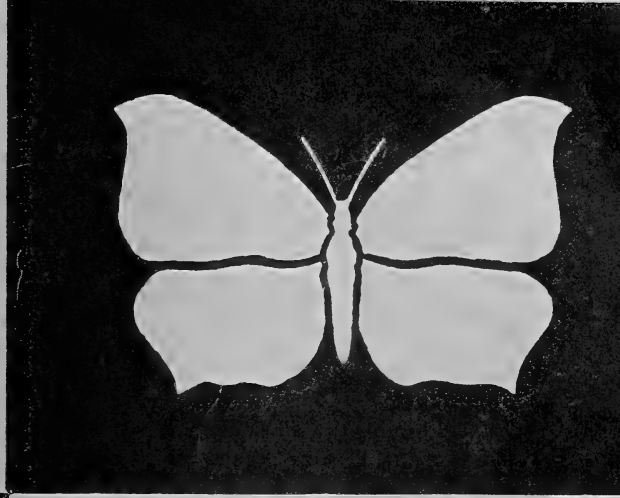

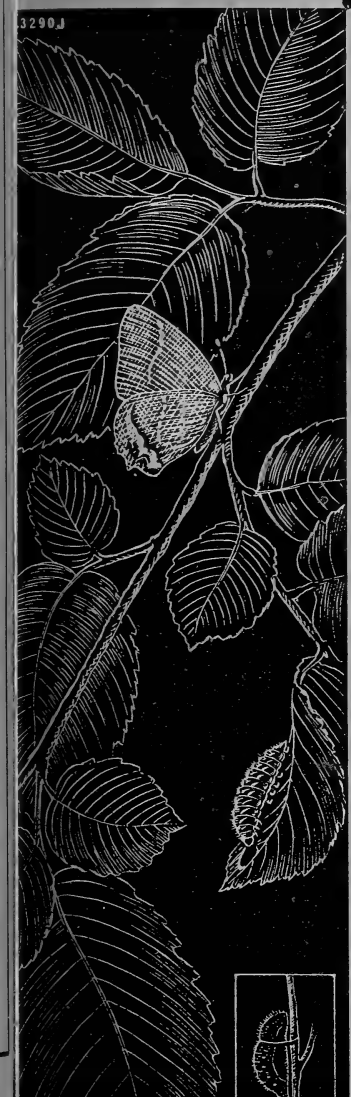

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : Bull. amat. Ent. Soc.

EDITED by H. V. DANKS, B.Sc., A.R.C.S., F.R.E.S.

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Advertisements in the AES Bulletin are seen by a wide cross section of entomologists and others interested in natural history generally. Subscribers include collectors in many overseas countries as well as foreign libraries and museums.

Despite a continued increase in printing costs, we have maintained our advertising rates at the lowest possible level and it is with regret that we decided that a small increase is now essential.

As from November 1969 for new advertisers and from February 1970 for current advertisers, the rates will be as follows:—

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Please address all enquiries to the:

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AES
BULLETIN

No. 279
MAY, 1968

EDITORIAL

Junior Members will be interested to learn of the attractive Junior Conservation Prize for 1968 (see the article below), which has been set up thanks to the interest and generosity of Sir Robert Saundby, and of Mr S. J. Whitehouse, and I hope that many Juniors will enter. It is not possible to over-emphasize the importance of conservation today, nor to stress too much that there is something that everyone (and this applies not only to Junior Members, of course) can do in this direction. Our Juniors always make an impressive effort at the Annual Exhibition: let them direct their energies here too.

As Members may be aware, this is the last *Bulletin* which will appear under my Editorship, and I would like to take this opportunity of thanking all those who have helped—in contributing to the magazine or in other ways—to make my task a pleasant one. It is with great pleasure, too, that I introduce my successor, Mr David Corke, who has very kindly volunteered his services and has recently been helping in the preparation of the Bulletin. Could I ask that Members try to simplify his job in the difficult transitional period: firstly by submitting plenty of material; and secondly by following wherever possible the guidance for authors given in *Bull. amat. Ent. Soc.*, **25**: 109-12. All copy and correspondence for the Editor should now be sent to: D. Corke, Esq., West Ham College of Technology, Department of Biology, Romford Road, London, E.15. Care should be taken to use this full address.

H. V. Danks (2907).

Front cover illustration: Larva and imago (pupa inset) of the White-letter Hairstreak Butterfly (*Strymonidia w-album* Knoch) on Wych Elm (*Ulmus glabra* Huds.), drawn by Mr J. Cooter (3290J).

●

JUNIOR CONSERVATION PRIZE

[The Junior Conservation Prizes kindly set up by Mr S. J. Whitehouse and Sir Robert Saundby (see *Bull. amat. Ent. Soc.*, **25**: 37; 73-4), failed to attract an entry in 1967, and no prize was awarded for that year. The donors of the prizes have, however, generously agreed to make a single combined prize worth £5 available for this year, and more specific suggestions for entries are also given to encourage Juniors to try for this very worthwhile prize.]

Junior Conservation Prize 1968

The Junior Conservation Prize for 1968—to be worth £5—will be awarded to the Junior Member (or group of Members) who contributes to the *Bulletin* (with the addition of supporting material if required) the best report of his service to nature conservation during 1967 and/or 1968. The purpose of the prize is to encourage Junior Members to take an interest and participate actively in conservation matters. To enable them to enter into a rewarding participation of this nature, some suggestions are given below, and fall into two categories. The first includes ideas for fieldwork directed towards conser-

vation. The second allows scope for constructive suggestions as to how the problems with which we are faced today when attempting to conserve our insects may be met.

Note that conservation of Orders other than the Lepidoptera is necessary in many cases and that our knowledge of the Lepidoptera—let alone these other Orders—is often insufficient in an area for useful conservation work to be done before knowledge is collected: knowledge towards which any keen Junior Member could contribute.

First category

1. A survey of the status of a species in an area, perhaps an area likely to be threatened by future development.
2. A study of the ecology of a given insect species, with particular reference to the aspects possibly vulnerable to changes in the habitat. Find out how the species fits into its niche in the habitat and the factors there by which it could be affected.
3. A survey (of a Nature Reserve or other area) in co-operation with the local Naturalists' Trust, etc.—frequently an entomologist is lacking from a local survey team, yet a complete knowledge of all the fauna is essential to direct conservation properly.
4. A report of the general assistance given to a conservation society, Naturalists' Trust, etc.
5. Work in a habitat—individually or with a society or group—aimed at the conservation of an insect species. Before this can be done it is essential to know the species' habits thoroughly (see 2 above).

Second category

1. An area of entomological value near your home is threatened by a housing development: what would you do about it?
2. How would you set about an ecological survey of a threatened area?
3. Indicate a species of our macrolepidoptera which you consider to be in serious danger, and explain why.
4. What do you regard as the chief threat to our insect fauna today, and why?

If you can write a contribution on one of the above, why not spare the extra time and answer where applicable by a practical demonstration?

H.V.D./R.S.

●

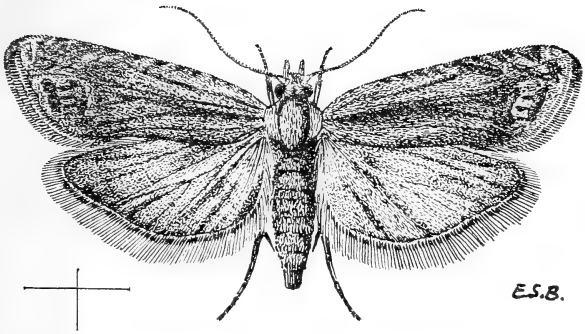
COLLECTING NOTES MAY, 1968

The Smaller Moths

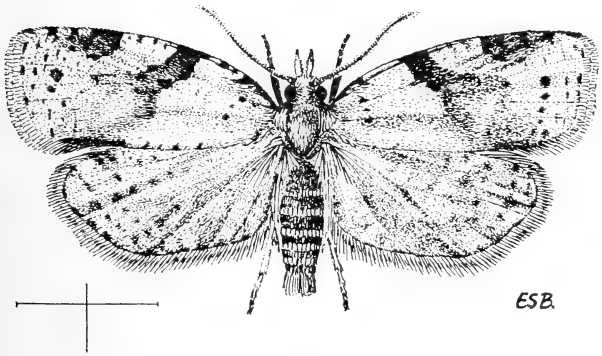
Lathronympha strigana Fab. (*hypericana* Huebn.). Mr Bradford's note reads as follows:— "I have bred this moth along with *Euspilapteryx auroguttella* Zell. from Perforate St John's Wort (*Hypericum perforatum* Linn.) which I discovered growing near some gravel pits at Park Street, Hertfordshire. In June I dug up a clump of the plant and, on arriving home, put it in a large flowerpot and kept it outdoors in a large container. Eventually about a dozen of each of the moths emerged.

"The forewings of *L. strigana* are of a brownish orange colour. There are leaden metallic streaks on the costa and the ocellus also has lighter metallic patches and black streaks. The hindwings are grey. The adult is on the wing in June and July and the larva feeds in spun shoots of the foodplant."

This is a common species with a wide range extending at least as far as the North of England. If you collect the spun shoots of Perforate St John's Wort in June, you are also



Lathronympha strigana Fab.



Clepsis costana Fab.

likely to come across the larvae of *Agonopterix hypericella* Huebn., which has a similar range. A third species associated with the same foodplant is *Argyritis* (*Aristotelia*) *atrella* Haw., the larva of which mines the stems in May.

Clepsis (*Tortrix*) *costana* Fab. Mr Bradford writes:— "In early May I visited a patch of waste ground within the studios of ATV at Borehamwood. Whilst there I took several specimens of *Mompha fulvescens* Haw. and *M. raschkiella* Zell. flying around *Epilobium* spp. Also in the spun leaves and shoots of the Great Willow-herb (*E. hirsutum* Linn.) I found about a dozen larvae of what proved to be *Clepsis costana* Fab. The larvae were of the energetic type, wriggling violently and often dropping to the ground. They were of a

dark brown colour—Meyrick states grey-green or brownish green, but my larvae were hardly green but of a deep brown. The adults all emerged between 15th and 26th June, which may have been a little earlier than their natural date of emergence.

"The overall colour of the forewings is ochreous with darker brown markings and spots. The hindwings are a paler fuscous with darker greyish brown markings. The larvae are said to feed on various other plants apart from *Epilobium*, including Knapweed (*Centaurea* spp.), Marsh Cinquefoil (*Potentilla palustris* Linn.), Sea Aster (*Aster tripolium* Linn.) and Sea Lavender (*Limonium vulgare* Mill.)."

If you have taken any *C. costana* as adults, you should examine them carefully in case there is another similar but little-known species among them. This is *Paramesia gnomana* Clerck which can be distinguished readily, since veins 7 and 8 in the forewing are stalked instead of being separate.

Mr Bradford mentioned two species of *Mompha* which he encountered in his patch of *Epilobium*. The larvae of the majority of the members of this beautiful genus feed on the different species of willow-herb during the spring and summer months. *M. raschkiella* Zell. is perhaps the easiest to find, as it has become common with the spread of its foodplant. This is the Rose-bay Willow-herb or Fireweed (*Chamaenerion* (*Epilobium*) *angustifolium* (Linn.) Scop.). The larvae mine the leaves, readily passing from one leaf to another—a convenient habit for the breeder. Tenanted mines are of a yellowish green colour, but they quickly turn white after the larva has gone. The mines may be sought for in May and June and again in August and September. In late May, too, *M. conturbatella* Huebn. spins the topmost shoots of this willow-herb together. The larvae are crimson-brown; black or greyish larvae will probably prove to be the ubiquitous *Olethreutes lacunana* Schiff. or one of the *Cnephasias*. A month later a much less common species may be sought in the stems; this is *M. nodicolella* Fuchs, the larva of which makes a gall, usually well above the base of the stems.

The Great Willow-herb (*E. hirsutum* Linn.) also repays the careful searcher. You will now be too late for *M. propinquella* Staint., which mines the young leaves of this and other willow-herbs in the early months of the year. But May is the season for *M. ochraceella* Curt.; after mining the roots and lower stems, its larvae burrow into the leaves for pupation. They are not difficult to find, but it is hard to keep the picked plants in good condition; if enclosed, they soon degenerate into a watery mush, while if left in the open they dry up and shrivel. Yet I have found that the pupae of *M. ochraceella* survive either misfortune, and the species is consequently an easy one to breed. Later on, in July, spinnings in the terminal shoots of *E. hirsutum* will contain larvae of *M. fulvescens* Haw. The smaller, younger plants are preferred. The pupa is in the spinning or in a folded leaf hard by, and this may be collected in August. *M. lacteella* Steph. is said to mine the leaves in August, but I have yet to encounter this species.

The smaller-flowered willow-herbs are liable to cross with each other and are not always easy to distinguish. *E. montanum* Linn. (Broad-leaved Willow-herb) is one of the commoner species. This is the foodplant of *M. subbistrigella* Haw., the larva of which feeds in the seed-pods in July and August; occupied pods are sometimes thickened or distorted. *M. decorella* Steph. makes a gall in the stem of this and closely-related

willow-herbs, often causing the plant to divide and branch above the gall. The larvae feed in July and pupate in the gall, when a tiny fragment of the white silk cocoon shows at the exit-hole. The adults emerge between the end of August and early October.

I have left the most beautiful of the *Momphas* till last. The larvae of *M. shrankella* Huebn. can be found in May and again in July mining the upper leaves of *E. montanum* and other small-flowered willow-herbs. The larvae, like those of *M. raschiella*, pass from leaf to leaf, but unlike that species they pupate on the plant, spinning leaves together or folding them. This species is relatively rare in the south-east of England, but gets commoner as one travels west. I have found it abundantly in the west of Ireland, where the foodplant is the Marsh Willow-herb (*E. palustre* Linn.).

A. M. Emmet (1379).

The Hymenoptera Aculeata

A recent publication from the United States prompts me to deal with the subject of trap nesting, and commend it to my readers for action during the 1968 season.

Many bees and wasps make their nests in cavities, either those they find pre-formed or those they bore themselves. The two commonest sites for such borings are the soil and dead wood, and it is the latter with which I want to deal here. Many types of wood can be utilised particularly if already tunnelled by beetles: tree trunks, logs, bramble stems, and in gardens bean poles, fence posts, and the like. Hence the extension to providing deliberately fabricated trap nests is a simple one.

Trap nests have been developed over many years and are the subject of one of our own AES Leaflets (No. 7 G. S. Kloet, 1951, *Some improved devices for rearing Hymenoptera*). The recent book that I mentioned above is: K. V. Krombein (1967) *Trap-nesting wasps and bees*, Smithsonian Press, Pp. vi 570, and is sub-titled *Life Histories, Nests, and Associates*. This is a massive compilation of the results of twelve years work during which about 3,400 nests of 118 industrious species were examined. A simple trap nest design was used, and the depth of the study lies in the placement of many traps in widely ranging areas over many seasons. Thus it gives a picture of the population occurring in one place from season to season, and also of the variation over a wide geographical, and hence ecological, range.

During the study new species were discovered, new associations between parasite and host established, and many other facets of life histories and behaviour studied. Some of the species Krombein was dealing with are holarctic in distribution and also occur in this country. The large eumenine wasp *Ancistrocerus antilope* Panz. is one such species, and the common leaf-cutter bee *Megachile centuncularis* Linn. and the chrysid *Omalus aeneus* Fab. are others. One particular finding which could not have easily been made by any other method has a relevance to our fauna. The eumenine wasp *Ancistrocerus catskill* Sauss. occurs in two colour forms previously thought of as sub-species, the yellow-marked typical form and the white-marked *albophaleratus* Sauss. Krombein found that these two forms occurred together in one nest as the progeny of one mother on a number of occasions. Hence the two forms are merely colour forms of the same taxon. We have in this country a similar situation in the eumenine wasp *Ancistrocerus pictus* Curt. which is yellow-marked in most of its range, but in the north-

west exists as a white-marked form. The name to be used for this species is the subject of a taxonomic wrangle and the priority of certain names revolves around these two forms being con-specific. Unequivocal data from trap nests would help to sort this out.

Krombein used very simple trap nests, merely bored out lengths of 1″ x 1″ planed, straight-grained wood. Three sizes of hole were found most useful, $\frac{1}{8}$″ (3.2 mm), 3/16″ (4.8 mm) and $\frac{1}{4}$″ (6.4 mm). Holes of these diameters were bored along the length of pieces of wood to within about $\frac{1}{2}$″ of the end. Lengths of 75 mm were used for $\frac{1}{8}$″ borings, and of 165 mm for the larger sizes. Some larger holes were used but would probably not be profitable in this country. Nests were put out in the field in bundles of six, two of each size. New traps were put out unsplit. Any traps that were occupied were split along their length with the grain of the wood to allow study of the nest contents. These were re-used after cleaning and heat sterilisation, the two halves being bound together with adhesive tape.

I hope I have written enough to interest some of my readers in this type of study, and that you will be placing some trap nests out this year. If you cannot cover many different areas, another way of adding interest to your study would be to place batches of different kinds of traps in the same area. Perhaps in addition to the wooden traps I have described, bundles of bramble stems could be prepared, some left intact for those species which like to make their own tunnel and some hollowed out.

To all those who try trap-nesting I wish the best of luck, and I will deal with the observations that should be made on any nests collected in a future article.

J. C. Felton (3740).

ANNUAL EXHIBITION SATURDAY, 7th OCTOBER 1967

A wet morning gave way to the fine warm afternoon we have been privileged to enjoy over a number of years. A large gathering of Members and friends, including a most encouraging number of new faces, thronged the hall from mid-day to the close and obviously enjoyed the exhibits and comprehensive array of entomological impedimenta.

It was interesting to hear the views expressed by two friends of the author of this report who were revisiting the Exhibition after a lapse of many years. Their impressions were practically identical. Generally they thought the whole concept was on a larger scale, there were more exhibits, their presentation was more ambitious and the former dominance of British species was replaced by world wide representation. Many exhibitors were working to a theme which besides adding considerably to the interest for the viewers also provided a modicum of useful research. Notably the sophisticated wares of the modern dealer compared favourably with the utility offerings of the immediate post-war years. Plastic was replacing wood and glass and weighty equipment had been succeeded by more portable versions.

Four specialist groups attracted well-deserved attention. Mr J. Heath was in attendance recruiting recorders for the Lepidoptera Distribution Maps Scheme, initially confined to the British Macro-lepidoptera. T.I.E.G. members had combined to produce an effective stand, including details of their field meetings. The Silkmoth Rearers' Group, formerly one of the Society's most vigorous sections showed many species and coloured photographs and is planning to attract new members. The other new section, the Amateur Conservation Group, was busily raising enthusiasm

for its extremely worthwhile objectives.

The Council were particularly gratified at the response of the Junior Members. Once again Senior Members had generously provided two prizes for the most imaginative effort and the selection of the two winners was no mean task. The eventual choice was:—
1. A. Lucas (3934J) 'Survey of Happy Valley'; 2. D. V. Lewis (5963J) 'Common Moths of N. Wales'. The project of D. J. Longman (4042J) 'Flight period of Moths', was highly commended.

In conclusion the Council wishes to express their appreciation to the organiser of the Exhibition, Mr B. F. Skinner and his many willing helpers, to Mr T. A. Robertson for his expert insect setting demonstrations, to the many Members who provided colour slides covering various aspects of Natural History and finally to extend a welcome to all our Members and friends to visit us again next year.

As in previous years as complete a list as possible was made of the exhibits in the time at our disposal.

Allen, R. (3628)
Insects of many orders taken in France during 1967.
Appleton, D. M. (3631)
Typical beetles from S. Hants, including a number of new records for the area.
Bayts, R.
Moths occurring in S. Devon and a collection of butterflies from S. France.
Bradford, E. S. (3068)
Moths taken in a garden at Borehamwood (Herts), mainly Pyrales and Micro-lepidoptera, during 1967 season.
Brent B., Miss
An interesting selection of British moths.
Brown, A. D. R. (3851J)
Varieties of British butterflies, bred and collected.
Brown, F. C. (2414)
Pictorial illustration of a plague of locusts in Egypt with maps, life histories and methods of prevention.
Bruce, C. G. (1746)
Moths associated with marshes, collection made at 'm.v.' light in E. Norfolk.
Collins, M. S. (3975J) *and Collins, J. S.* (3762)
A family tree for Coleoptera, with representatives of all major families and types, affording a worldwide coverage.
Cribb, P. W. (2270) *and Cribb H. J.* (2044)
Coleoptera collected in Italy during 1967 trip. Representative collection of local British butterflies in danger of extermination. European butterflies from Lepontine Alps and N. Italy.
Crow, P. N. (393)
Aberrant Lepidoptera, parasitic flies, and Diptera from various localities in Great Britain.
Denny, C. C. (2880J)
A survey of the Lepidoptera of Newquay, Cornwall. Also insects from other English localities.
Dobson, J. and Decks, P.
'M.v.' light-trap records from the Kenton (Mddx) district of N.W. London.
Drake, J. H. (4117)
Larvae and imagines of the silkmoths *Rothschildia jacobaeae* Walk. and allied species.
Else, G. R. (3881)
Selection of typical Lepidoptera from S. Hampshire.
Gardiner, B. O. C. (225)
Exotic silkmoths bred in Great Britain. Other foreign Lepidoptera bred from ova, some for the first time recorded in this country. Also the striking variation resulting from the continuous in-breeding of *Pieris brassicae* Linn. (Cabbage White Butterfly).

Hawkey, P. M. (3654J)

Maps, photograph and specimens representing a survey of the Lepidoptera of a Cornish Cove.

Haynes, P. G. (3912)

Interesting series of Syntomidae, medium-sized day-flying moths, often mimics with warning colours, and Arctiidae (Tiger moths), from localities all over the world.

Hilliard, R. D. (99)

1967 'm.v.' light-trap records from a Stanmore garden in N.W. London, emphasising the dominant species for each month of the year.

Hough, M. J. (3354)

Venezuelan Lepidoptera, many species unidentified.

Howat, Dr. I.

Comprehensive groups of Coleoptera and Hymenoptera from the Amazon Basin and Lepidoptera from Jamaica.

Lewis, D. V. (5963J)

A survey of some of the common moths occurring in N. Wales, illustrated with locality maps and diagrams and descriptions of the life histories.

Longman, D. J. (4042J)

A detailed investigation into the flying periods of the commoner moths occurring in a garden at Abingdon, Berks.

Lucas, A. (3934J)

Ecological survey of the Lepidoptera of Happy Valley, Old Coulsdon, near Croydon, Surrey. Illustrated with photographs, specimens and log book for reference.

Majeris, M. (4027J)

Lepidoptera of the Luxembourg Ardennes with log book of operations.

McCormick, R. F. (3375)

A wide range of British Lepidoptera, all of which have been bred.

Muirless, M. (4032)

Collection of Heliconiinae, a family exclusive to tropical America. These are brilliantly coloured, narrow-winged butterflies with black background and coloured bars.

Perrie, W.

Exotic Lepidoptera in a variety of special showcases.

St. Ivo School Natural History Society. (2941A).

As in previous years an enthusiastic contingent provided as a centrepiece to our Exhibition a surprisingly wide selection of living creatures, all of which are currently being bred by the schoolboy members of the Society.

Selbourne Society

Detailed records of the moths from two 'm.v.' traps situated in the grounds of the Perivale Bird Sanctuary (S.W. of Wembley, Middlesex), being part of a general natural history survey of the area.

Skinner B. F. (2470)

Local and unusual species of Lepidoptera collected and bred during 1967.

Taylor P. (3571)

Representative butterflies found in the mountains of the Hautes Alpes during a collecting trip in 1967.

Uffen R. W. J. (1660)

An impression of sub-alpine Switzerland, with description of visit and species of Micro-lepidoptera, Orthoptera, Hymenoptera, etc., collected.

Warren-Smith C. D. (3908J)

Survey of the butterfly population of a mountainside in the N.E. Pyrenees of Spain with specimens and illustrations. Also larvae of the British Lobster moth (*Stauropus fagi* Linn.).

Waters A. (2615)

A representative collection of European butterflies.

Young L. D. (4012)

Series of *Lycaena phlaeas* Linn. (Small Copper Butterfly) to illustrate the variation occurring in S.E. England.

Zoological Gardens (London).

By courtesy of the Director, a selection of livestock was shown, a

species of giant stick insect being of special interest.

R. D. Hilliard (99).

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SOME NOTES FROM ESSEX

In spite of the delightful weather in Essex during the last month or so, what a late season it has been. Only in the last two or three weeks (mid-July to mid-August) has much been seen in the way of local and generally abundant species, let alone anything out of the ordinary. At the time of writing (August 1967) Peacocks (*Nymphalis io* Linn.) are beginning to appear in reasonable numbers, and in the fields and grasslands locally the 'Whites' and 'Browns' are really getting into their stride. A dearth of Red Admirals (*Vanessa atalanta* Linn.) is evident, and even Skippers (*Ochlodes venata* Br. and Grey and *Thymelicus sylvestris* Poda), normally abundant species on the open grassland of the nearby forest, are conspicuously reduced in numbers.

Last year, in July, I obtained about a hundred larvae of the Peacock from nettles (*Urtica dioica* Linn.), and—rearing them in an improvised garden cage—produced about sixty perfect specimens. This year not a single larva has been seen on the same nettles. Orange Tips (*Anthocaris cardamines* Linn.), which are normally plentiful in this area, were completely non-existent in May and June.

One good catch a week or so back, however, is worth recording. I was visiting an area near Passingford Bridge, about six miles from Chigwell, Essex. This is open grassland, with small densely forested areas, and during my visit there an unfamiliar shape went winging by and up into the trees. I prowled around the area, and soon my patience was rewarded, for a few minutes later I saw a pair of White Admirals (*Limenitis camilla* Linn.) sitting on a branch, quite out of reach, but quite distinctive. I gave up hope of catching them, but one of the pair came down to investigate *me*, and was quickly netted. Closer inspection showed that one wing was damaged, but as it was my first White Admiral I couldn't let it go. A White Admiral caught in Essex, within fifteen miles of Aldgate pump, should be of interest, and I wonder whether any other collector in Essex has had a similar experience—I should be interested to know.

Finally, a week or so back my young son came back with a most curious looking larva in his hand, later identified as that of the Alder Moth (*Apatele alni* Linn.). The larva has now become a pupa, without the aid of a piece of rotting wood.

14.8.67. B. A. Mason (3834).

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COLLECTING IN SCOTLAND

On 26th August 1967 I set out with my three sons to search for some larvae of the Emperor Moth (*Saturnia pavonia* Linn.) which I hoped to find in the surrounds of the Corby loch. This is a small stretch of water, surrounded by a boggy moss, a few miles north of Aberdeen. I first discovered this happy hunting ground thirteen years ago when I found larvae of the Emperor, Poplar Hawk-moth (*Laothoe populi* Linn.) and Puss Moth (*Cerura vinula* Linn.). In subsequent years I have met with varying degrees of success on my visits there;

one year I only collected about four caterpillars of the Broom Moth (*Ceramica pisi* Linn.) after a whole morning's search.

On this occasion I had only just parked the car when the youngest of the three boys found the green and white larva of a Spectacle Moth (*Abrostola tripartita* Hufn.) in a roadside nettle bed. No more were found in the immediate vicinity so we set out on our walk over two fields to the loch with eager anticipation.

Our collecting equipment was supplemented by a large white sheet which I intended to place under the Great Sallows (*Salix caprea* Linn.) when I beat the foliage for larvae. This method did not prove entirely successful so it was decided to concentrate our search on the smaller bushes where caterpillars could be easily seen.

Soon a batch of blackish caterpillars about a quarter of an inch long were found grouped on the leaves of a spray of sallow. They numbered about a hundred and it is thought that they were Wood Tigers (*Parasemia plantaginis* Linn.). Thus encouraged we searched diligently, finding countless numbers of Vapourer Moth (*Orgyia antiqua* Linn.) and Broom Moth larvae.

In one sallow bush I found a caterpillar which was new to me. About half an inch in length, it was covered with white hairs and sported three russet coloured tussocks, two behind the head and the other near the tail. I collected about a dozen of this species and identified them later as larvae of the Nut-tree Tussock (*Colocasia coryli* Linn.). Light Knot Grass (*Apatele menyanthidis* View.) caterpillars were found feeding in prominent positions on the sallows, often basking in the sun which prevailed during the morning.

What I thought was the minute larva of a Puss Moth turned out to be that of a Sallow Kitten (*Cerura furcula* Clerck). During the course of the morning another two were found.

A huge larva of the Pebble Prominent (*Notodonta ziczac* Linn.) was the next caterpillar to excite interest but still we could find no trace of the Emperor Moth.

Quite a few Pink-barred Sallow Moths (*Citria lutea* Stroem.) their colour as of dead leaves, rendering them well nigh invisible, were found resting among the leaves of the sallow bushes. These moths were carefully caught and transferred to the killing-jar.

The best of the morning gone all too quickly, we hastened to a drier part of the moss and here in a taller sallow my eldest son found two magnificent Poplar Hawkmoth larvae. Shortly after this I came upon the first Emperor Moth caterpillar which was happily browsing on a sallow branch which it was systematically stripping. A few yards away was a straggling clump of small bushes which stood isolated from the rest of the trees. Here we found six Emperor larvae of varying sizes.

The brilliant sunshine no doubt had tempted out the Small Copper Butterflies (*Lycaena phlaeas* Linn.) which were abroad in profusion; while the occasional Green-veined White (*Pieris napi* Linn.) was seen over the moss.

Common Marbled Carpet Moths (*Dysstroma truncata* Hufn.) were numerous, flying from the trees when dislodged by our searching for larvae. I also took a few Chevron Moths (*Lygris testata* Linn.) but as this was primarily an expedition in search of larvae I did not bother much chasing imagines.

Our allotted time expired, and well pleased with our morning's collecting, we returned to the car.

E. Pickard (3928).

HORMONES IN INSECTS (PART TWO)

In the second part of this article, I am going to describe some experiments to illustrate some of the functions outlined briefly in part one (*Bull. amat. Ent. Soc.*, **27:** 13-18). A large part of the time spent in experimental entomology is taken with acquiring the skill and insight which is so necessary. So don't be surprised if one or two of the experiments don't work out first time. The first experiment is fairly foolproof (I teethed on it in my studies!), but odd things might go wrong in others. Be alert for this—many interesting things have been found by someone getting the "wrong" result, and finding the reason. There is no such thing as a wrong result: it is merely a different one!

Near the beginning of part one, I said that one can investigate a hormone system by cutting off the supply of the hormone. With insects we are lucky, since we can do this simply by tying a piece of thread round the insect. This stops the blood from flowing. Thus if a hormone is being produced in one part of an insect, a piece of thread tied round the insect's body will restrict the area of influence of the hormone, and we can get some idea of what the hormone does. Also, by successive ligaturing experiments, the timing of the release of the hormone may be gauged very accurately, and some idea gained of the part of the insect from which the hormone is released. The final test of a hormone-producing organ is to take the organ out, note that the effect of the hormone disappears, then replace the organ and note that the effect returns.

The first experiment is concerned with hardening and darkening in the blowfly (*Calliphora* spp.). The experimental animals are easiest obtained by buying some maggots from a fishing-bait shop. The maggots should be kept in clean bran and allowed to pupate. When the first few adults emerge, the pupae should be put into the fridge (at about 6 °C, 42 °F) and left for about a week. Under these conditions, the pupae will mature but the adults will not emerge. When the pupae are brought back to room temperature, the adults will start to emerge after about five minutes. In the meanwhile have ready some pieces of sewing thread tied in an ordinary overhand loop. Slip this loop over the fly's head and tie it round the neck, pulling the knot firm. This will stop the blood from the head flowing back into the rest of the body. Control animals should be of two classes—one with a ligature tied round the proboscis (this is a bit more difficult) and one with no ligature. You should find that if the fly's neck is tied off within about two minutes of its emergence, no hardening and darkening of the cuticle will occur. If the neck is tied off any later, darkening *will* occur. (There may be a rather blotchy form of darkening rather later in some of the undarkened flies. This is so-called "secondary darkening". The mechanism behind this phenomenon is unclear.) The flies with a ligatured proboscis should darken normally, thus showing that the *positioning* of the ligature is important, and that the expansion of the cuticle when the fly blows itself up has no effect on the darkening. (The converse of this last statement is different: how can the fly force its way out of the puparium while it has a soft cuticle, and then blow its wings up later? For both actions it is using the pressure of its blood to do the work.) The unligatured controls provide a check that the flies will harden and darken if you don't do anything to them.

A further experiment gives some

insight into the control of the release of the hormone. In the "wild", flies normally pupate in soil or compost and have to dig through this after emerging from the puparium. It was observed as long ago as 1935 that the flies could be kept digging for over seven hours without hardening, and still harden and darken normally when they finally emerged into the open air. There is a simpler way of achieving the same effect. If you take a fly which has just started emerging and put an empty puparium over its head, the fly will obediently crawl out of its own puparium, and head first into the empty one. The fly may be kept stuck like this for as long as you like, since it hasn't got enough room to turn round and crawl out again! When you finally release the fly, it should harden and darken as if nothing had happened at all (is this true no matter *how* long you keep the fly trapped, if not why not, and are there several reasons for this, and would they all be acting at once or in sequence, or . . .?). The only way this could occur is by nervous signals to the brain from the surface of the fly telling it when it is in an open space (do the eyes play any part here? Would it be a 'Good Thing', e.g., if the insect were to emerge by night? But then what is the lower threshold for light perception in the insect's eye?). The release of the hormone must thus be under nervous control. Research on this hormone system shows that the hormone, Bursicon, is released from the brain under nervous control and that this stimulates further production of the same (?) hormone from the rear end of the thoracic nerve mass. Since in the blowfly the entire nervous system of the abdomen has contracted up into the thorax, this part of the nervous system is equivalent to the VIIIth or last abdominal ganglion of most insects. So if you keep cockroaches or some other insect which shows a lot of darkening after the moult, try tying a bit of cotton round the abdomen and report your results in the *Bulletin*. Except in the case of the cockroach itself, it will be new knowledge! On the other hand, in such insects you can see the dorsal heart in the newly emerged (*i.e.*, white) insect. You will see the cuticle just above the heart darkening before the rest of the cuticle, showing that the hormone is being distributed by the blood stream. (This is the "official" version. I have my doubts. *Can* the hormone diffuse through the wall of the heart as it is carried forwards in the blood to cause this darkening? *Is* it the cuticle which is darkening? Is the blood itself, or the wall of the heart reacting to a high concentration of the hormone? *Is* it the hormone which is causing this localised colour change? Simple dissection of an animal showing this darkening should answer some of these questions.) Another little thing you can do is to kill the newly emerged cockroach by putting it into the deep-freeze. Then let it thaw out again and you will see that the cuticle starts to darken from the rear end of the animal, as the hormone diffuses away from the site of its release. Of course, it *may* be that the cuticle at the rear end of the animal has a different reaction to the hormone. Unfortunately, in all other insects apart from the fly, the mechanism of the control of release of the hormone has not been clearly defined. There is evidence that in the cockroach there is a nervous signal sent down the nerve cord to do the job, but there are also some rather contradictory bits of evidence showing a control of release similar to that found in the blowfly. My own work on locusts seems to support this.

A rather more lengthy experiment which needs a bit more skill and patience is one where you can make one half of a maggot pupate, while

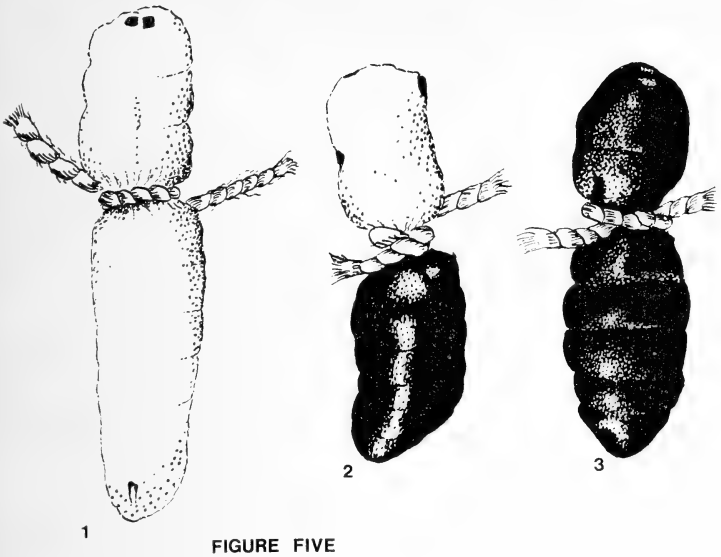

FIGURE FIVE

Ligatured maggots - just after ligaturing, and results of timing (see text)

the other doesn't! As stated in the first part of this article, the hormone responsible for moulting is Ecdysone. In maggots, the peritracheal gland (see *Fig.* 6) which produces it lies immediately behind the brain. If the maggot is ligatured in the middle about 16 hours *before* pupation, only the front end pupates. So your experimental method here will be to wait until the first few maggots have pupated, then ligature some of the

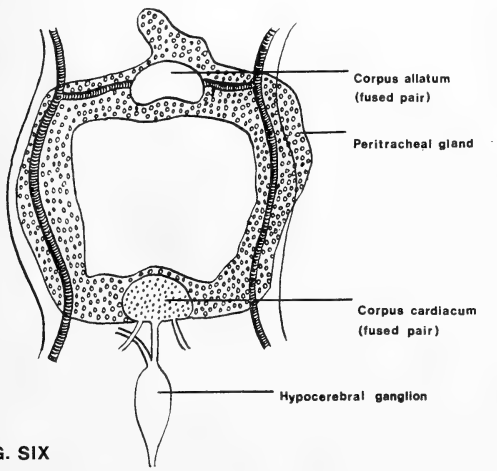

FIG. SIX

Calliphora ring gland

largest (presumably the most mature) around the middle of the body (see *Fig.* 5, No. 1). Use about thirty or forty maggots, and don't pull the ligatures too tight, or you *will* end up with two halves—separate ones! Then look at the maggots fairly often (about once every hour or so). Maggots pupating in the first sixteen hours will look like Figure 5, No. 3, but after about sixteen hours, any maggots which pupate should pupate in the front half only as in Fig. 5, No. 2. This shows that there is a gland in the pupated half which is producing a pupation hormone. In this case it is the peritracheal glands producing Ecdysone. If you now try putting the ligatures in different places, you should be able to get a fair idea of where the glands are. All you have to do then is make a dissection, and find the ring gland. The peritracheal glands have their "critical period" about sixteen hours before pupation, but they themselves are activated by the AH from the corpora cardiaca (see part one). Since both the peritracheal gland and the corpora cardiaca are in the ring gland (also known as "Weismann's Ring"), the critical period for the AH cannot be determined using the ligature technique in the maggot. However, you can try this out on some of those other larvae you have been breeding, since in the Lepidoptera the brain is in the head capsule while the prothoracic glands are in the thorax. So now determine the critical period of hormone release of the prothoracic glands as for the maggots. Then you can determine the time of release of the activation hormone from the brain in a similar manner, putting the ligature around the neck. This critical period will probably occur within the day previous to the prothoracic gland critical period, but that is a matter for experiment. It would be interesting if you could find any behavioural changes coinciding with these periods.

For the final experiment, I shall describe one which shows a hormonal control of colour in the stick insect. It is probably the easiest of the lot, since the insect does not have to be operated on at any critical stage in its life history. If a nymph of the stick insect is ligatured about half-way down the body, the diurnal colour change continues only in the anterior half of the body while the posterior part remains constantly light in colour. If you do not pull the ligature so tight as to cause internal damage to the animal, it may be removed later, and the entire body will once more show the colour change rhythm. This experiment may be extended to *in vitro* conditions. Take some of the cuticle from a stick insect, and put it into some saline (a solution containing 7.5 gm of sodium chloride and 0.375 gm of potassium chloride per litre should suffice). Then add blood from a dark-adapted insect. The cuticle should darken, though you will have to play around with the relative amounts of blood and saline to get the colour change to work properly. (It is important to note that this darkening is due to movement of pigment in the epidermis, and is not related to the experiment with the blowfly.) You now have a good *bioassay*, or method for making objective measurements of the actual amount of hormone in the blood. So now you can ask such questions as how long does it take for the hormone to be released once the animal is placed in the dark; how dark does it have to be to produce the effect; does the animal use its eyes to perceive the light intensity (paint the eyes with an opaque paint), or its ocelli, or has it got a dermal light sense?

Well, there you have plenty of experiments, none of which are very complicated, and a lot of which could provide new information. I hope you

will follow some of them up. In any case, you can always publish any ideas and results you may have in the *Bulletin*. I have already quoted a couple of books on the subject in part one. If you *really* want to get embroiled in the subject, Novak's book is very detailed, and gives nearly all the references to original papers on the subject. In the last resort (and I would prefer it that way!), you can always drop me a line at the address below, and I will leave my beloved locusts and endeavour to help.

9.67. J. F. Vincent (3027).
Department of Zoology,
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Sheffield, 10.

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MOTH MARKING

In the spring of this year I marked and then released a large number of moths. I did this to try and find out if moths of certain species wander a lot while flying, and also to see if the moths I checked live for a long time.

Method

The moths were caught primarily in my mercury-vapour light-trap and then I painted a number on the moth's wing with a white cellulose paint. The number was noted down with the date. All the moths which I marked were released that evening about fifty yards away from my trap. This was carried out for quite a few nights.

Results

This experiment was only carried out with the Common Quaker (*Orthosia stabilis* Schiff.) the Clouded Drab (*Orthosia incerta* Hufn.) the Hebrew Character (*Orthosia gothica* Linn.) and the Red Chestnut (*Cerastis rubricosa* Schiff.) Here is a small table of results.

Orthosia stabilis

Thirty-three specimens were released and two were recaught, one twice. The first specimen that was recaught was released on 21st March and recaught on the 24th and on the 28th of the same month. The second specimen was released on 4th April and was recaught on the same night.

Orthosia incerta

Forty-six specimens were released and seven were recaught. The first specimen that was recaught was released on 21st March and was recaught on 23rd March. One specimen was released on 21st March and recaught on the 24th and two on 3rd April which were recaught on 3rd and 4th April respectively. Three specimens were recaught out of a batch of ten released on 17th April, and they were recaught on the 17th, 18th, and 19th respectively.

Orthosia gothica

Fifty-one specimens of this species were released and only one of these was recaptured. It was recaught first on 2nd April and again on 3rd April after being first released on 31st March.

Cerastis rubricosa

Seven specimens of this species were released and only one was recovered. It was released on 4th April and recovered the same night.

26.11.67. D. J. Longman (4042J).

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RELAXING LEPIDOPTERA

It would seem from the AES *Bulletin*, Vol. 26, No. 274, February

1967, that Junior Members are becoming more numerous than ever. It occurred to me, thinking back to my early days in the study of Lepidoptera, that some of them may have the same difficulty in relaxing long-dead specimens that I had. I used to use the method of my day, a tin of damp sand, blotting-paper and a twenty-four to forty-eight hour wait for specimens that by then either flopped all over the place, sprang back, or were covered by mould. It is several years now since I started to use a hypodermic syringe and hot—not warm—water to relax my insects. I now use a B.C.G. disposable syringe for all insects, from some of the large Malayan butterflies that I relaxed last Christmas to some 'Micros' that I picked up in Chedworth Woods last week. A bone-hard *Danaus plexippus* Linn. can be completely relaxed in ten or fifteen minutes. My method with the larger insects is this: the specimen is laid on its side on several thicknesses of blotting-paper and the needle is pressed into the thorax just below the wing muscles and a slight pressure applied to the plunger. The insect is then turned over and the same process carried out. If the antennae have to be moved they must be wetted at the root and along their length at least twice. The specimen is then left for seven or eight minutes and the same thing done again but this time with a considerable pressure on the plunger so that the water spurts from the orifices in the thorax —hence the blotting-paper—and is then left for a few more minutes, after which time it is completely relaxed. With the smaller butterflies and moths down to the size of *Cupido minimus* Fuessl. I use the same procedure; anything smaller than that I put in the palm of my hand under the lens and pierce it in the centre of the thorax from above, making sure the hole will be the one occupied by the setting-pin. A merest touch on the plunger is sufficient: any excessive pressure will distort the wings or blow off the head. These smaller butterflies and moths are ready in a few minutes. Any moisture on the outside of the body is picked up with quarter-inch wide strips of blotting-paper cut to a point at each end. If the insect had stiffened with the head twisted to one side, then some difficulty would be met with in trying to straighten it. Even though the wings are completely relaxed the head would stubbornly refuse to turn until it had been soaked at the 'neck' from the outside for some time. An added advantage of this method of relaxing is the short period of drying time necessary. The largest of butterflies will set perfectly stable in one week at ordinary room temperature. Perhaps it is the clearing of the natural orifices of the body under internal pressure which enables the dehydration to go on apace.

4.7.67. L. R. Lassman (3254).

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PARASITIC INSECTS

Various Orders of insects contain parasitic species, but only three will be considered in this article. These are:

1. the fleas (Order Siphonaptera). These are characterised by a body which is flattened laterally, absence of wings, and the power to leap into the air. The eggs of fleas develop *off the host* and hence the only stage likely to be found on a mammal or bird is the adult flea.

2. the lice (Orders Mallophaga and Anoplura). Characterised by a body which is flattened dorso-ventrally, these insects again have no wings, and are unable to jump. The metamor-

phosis of the louse (which is incomplete) occurs on the host so that all stages, including eggs, may be encountered.

3. the 'louse-flies' or Hippoboscids (Order Diptera, family Hippoboscidae). These are also flattened dorsoventrally but wings may or may not be present, or may be vestigial. The family consists of two-winged flies which have become adapted, in the adult stage, to a life of parasitism. The legs are long with sharp claws, and the whole insect is frequently described as 'crab-like' in appearance and movement. One species (*Melophagus ovinus* Linn.—found on sheep) undergoes its whole life-history on the host, but most species, according to Edwards, Oldroyd and Smart (1939), survive in the nests or holes of their hosts.

The purpose of this article is not to describe in any detail the structure or life history of any of these parasites but to remind the amateur entomologist of their existence. At the same time, a method of capture of small rodents which has been found useful in parasite collecting is described. Information on the parasitic insects is sadly lacking and therefore *any* entomologist encountering any parasite would be well-advised to catch and preserve it, together with full details of the host, locality and date. As Rothschild and Clay (1952) have pointed out in their admirable book '*Fleas, Flukes and Cuckoos*', much valuable material has been wasted in the past, especially when nests of rare birds have been examined, owing to the lack of a parasitologist or someone far-sighted enough to collect such specimens.

Insect parasites may be collected in a number of ways. Recently killed animals (e.g., on the roads) may be examined, and in this way the writer has collected large numbers of fleas and lice from mammals, such as Badgers (*Meles meles* Linn.), as well as fleas and Hippoboscids from birds, such as Swallows (*Hirundo rustica* Linn.). Alternatively the homes or habitats of the hosts may be searched, and this is particularly rewarding in the case of birds' nests. Finally, living animals may be captured and parasites removed. In some cases the parasites may be obvious but careful searching may be necessary to detect fleas moving through the denser parts of the hair, or louse eggs ('nits') adherent to the hair shafts. In the case of the fleas on the larger mammals, certain sites seem to be particularly popular—the ears, above the tail and between the legs.

One method of live capture which the writer finds suitable for small mammals (e.g., mice, voles and shrews) is as follows. The well-known 'Longworth trap' is used, which captures the animals alive. Each trap is baited in the evening (using cheese, apple, meat, biscuit, etc.). It is also important to include bedding such as wood-wool or screwed-up newspaper as otherwise the captures may die from the cold overnight. The next morning the traps are examined and all "set" traps taken indoors. Captured animals are carefully transferred, one at a time, to a jam jar which contains an inch of cotton wool on which a few drops of the anaesthetic ether have been dropped. The animal is quickly anaesthetised by the ether and, when unconscious, is taken out and placed on a sheet of white paper. The next part of the job must be performed as rapidly as possible as the animals will quickly regain consciousness. A blunt-ended seeker is run through the fur and the exposure of underlying areas is facilitated by blowing gently. In this way parasites are exposed. The ears are particularly important and, apart from insect parasites, mites may often be found on this site. The great value of the ether, apart from facilitating handling of the host, is that it also anaesthetises

the fleas—these fall on to the white paper where they are readily visible. Some may also be found on the cotton wool in the jar and it is important that this is examined before the next mammal is anaesthetised. Each host is marked by clipping a small portion of hair from the body —a simple key can be used so that each animal may be identified if recaptured. Having now regained consciousness, the host is released at the point of capture. The ectoparasites are placed in 70% alcohol, together with a data label (written in pencil) and can be identified at leisure. In one such study, carried out in Bristol (Clutterbuck and Cooper, 1965), the following mammals were caught regularly.

1. Long-tailed Field Mouse (*Apodemus sylvaticus* Linn.)
2. Bank Vole (*Clethrionomys glareolus* Schr.)
3. House Mouse (*Mus musculus* Linn.)
4. Common Shrew (*Sorex araneus* Linn.)

Of these, 43% of all captures were found to be infested with fleas, 21% with mites and 21% with ticks. (In this study lice were not investigated.)

The value of this method of capture may be summarised as follows:

1. It is simple and relatively inexpensive. Traps may frequently be borrowed from a local museum or natural history society. Ether can *usually* be obtained, in small amounts, if a chemist is approached and told the purpose for which it is required.
2. There is no need to kill the host, and consequently much can be learnt about its habits. The marked mouse or vole is frequently recaptured and its movements can therefore be traced and the degree of re-infestation by parasites within a given time ascertained. Regular movement of traps will usually give a clear indication as to areas which are heavily or lightly populated by the respective host species.

If hosts *are* to be killed, then overdosage of ether is recommended. The method suggested by Smit (1954), *i.e.*, throttling through a bag, is not recommended on the grounds that it is inhumane.

J. E. Cooper (2343).

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PROLONGED LARVAL STAGE IN *AUTOMERIS AURANTIACA* WEYM.—II

I am now in a position to conclude my article on the prolonged larval stage in *Automeris aurantiaca* Weym. (*Bull. amat. Ent. Soc.*, **21**: 52-4). I will therefore begin with a brief recapitulation. In 1966, I received a single batch of eighteen ova and from these I reared nine pupae. The larvae that hatched from these ova grew at different rates and in such a way that they could be separated into three types—fast, normal and slow growing types. I also compared this phenomenon with a similar experience whilst rearing *Automeris illustris* Walk.

The nine pupae obtained by the end of 1966 all produced moths in April and May 1967. The emergence period was spread over forty-three days and as can be seen from the table below, the length of time spent in the pupal stage was not uniform.

Moths, in order of pupation	1	2	3	4	5	6	7	8	9
Sex	M	F	M	F	M	M	M	F	F
Length of larval stage (days)	80	80	99	99	101	101	103	150	208
Length of pupal stage (days)	225	263	219	227	228	228	230	180	140
Total	305	343	318	326	329	329	333	330	348

1, 3, 5, 6 and 7 were males and 2, 4, 8 and 9 were females. (This is a correction to the order given in my previous article.)

The difference between the longest and shortest larval stage was 128 days and that of the pupal stage 123 days. However the greatest difference in the length of time spent in both the larval and pupal stages was only forty-three days. Therefore as I expected the great difference in the length of the larval stage is more or less corrected by a corresponding difference in the length of the pupal stage.

The females spent on average fifteen more days in the larval and pupal stages together, than the males. Although there is this difference in the overall time taken by the different sexes, it is an additional factor and cannot be used to explain the original phenomenon. That this is so is borne out by the fact that both the fastest and slowest growing larvae produced female moths.

I decided to obtain pairings from these moths in order to determine whether the difference in growth rate was genetically controlled. After all, as all the larvae were reared in identical conditions it does not seem likely that the environment produced these differences. I succeeded in obtaining pairings between males of the normal growth type and females of all three types. All the pairings produced fertile ova which hatched in due course. However, with one exception, none of the larvae survived beyond their third instar. Once they had reached this stage, they appeared unable to make any further growth and died. This may of course have been as a result of inbreeding, though it certainly did not appear to be the result of a disease. However, even at this early stage of development, the progeny of the pairing between the normal male and normal female could already be separated into the three groups.

This was a disappointing end to the study of what I regard as an interesting problem. Indeed, far from solving the reasons for the prolonged larval stage, I can now pose some new questions. Firstly are we to assume that the larvae that feed for only 80 days consume as much as those that feed for 150 or 208 days? (Could it be that their digestive system is much more efficient?) Indeed, because of their lengthy pupal stage and resulting requirement for a larger food reserve, one might expect their nutritional requirements to be greater. Secondly I would like to suggest two possible explanations for the behaviour of the pupae.

1. Development proceeds at a slower rate in the pupa of a fast growing larva than in those of the other types.

2. Development takes the same time in all the cases and the moths remain, for different lengths of time, fully developed within the pupa until the emergence period.

If this second case is correct, then a mechanism must be present to ensure that the moth emerges at the right time.

As I indicated in my previous article, I do not think that this behaviour can be an isolated occurence in *A. aurantiaca*. Therefore may I make a request to other Members for records, either in the *Bulletin* or sent to myself, of similar behaviour in this or other species.

23.9.67. J. Muggleton (3253).

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CORSICA EAST OF THE MOUNTAINS

It was in 1962 that I applied for, and much to my astonishment received, a sum of money from the University of Birmingham Guild of Graduates Travel Bursary, to enable me to go to Corsica to study and collect insects. It is to that Guild that I owe the most interesting and profitable two months collecting of my life to date. I left England with my friend Mr C. D. Gadd (3033) on July 23rd, journeyed by most of the means available down the mainland of France, stopping off at intervals to collect, and finally arrived in Corsica on August 9th.

Corsica is located in the Mediterranean sea at approximately 42°N: 9°E. Its butterfly fauna has certain affinities with those of Sardinia (to the south) and Sicily (to the south-east). The area studied on the east of the island extended from Bastia, south-west about 5 km into the mountains and about 100 km due south as far as the village of Solenzara. The species noted were recorded between August 9th and September 11th., during a hot, dry summer in which temperatures of up to 28°C were recorded (local news). During this period, Bastia received a few hours of rain only once, on the evening of September 4th., but we were at that time near Solenzara, which missed the storm.

Above Bastia, terraced mountain slopes with outcrops of rock alternated with gullies supporting a more closely-knit vegetation consisting of bushes overhung with a species of *Clematis*. Growths of Grape-vines (*Vitis vinifera* Linn.), Orange trees (*Citrus* sp.), Fig trees (*Ficus carica* Linn.) and Olive trees (*Olea europaea* Linn.) appeared irregularly. The open places were mainly dominated by patches of a spiky-leaved Composite, looking like bleached thistles touched up with orange-brown dye. The inflorescences of these plants proved on close inspection to consist of flowering florets from which many insects, including species of butterflies, extracted nourishment. Between the patches the ground was partially colonised by sun-bleached grasses with narrow leaves, between which bare rock or light, sandy soil gleamed in the sun. Opuntia cacti with "barbary fig" fruits, and giant Aloe succulents with long, thick leaves each topped with a single sharp spike, and bunched yellow inflorescences supported by thick stems fifteen or more feet high, added a touch of Mexico to the scene.

Green lizards (*Lacerta viridis* Laurenti), Wall lizards (*L. muralis* Laurenti), Mauretanian geckoes (*Tarentola mauretanica* Linn.) and Green tree-frogs (*Hyla arborea meridionalis* Boettger) doubtless take their toll of insect life. Insects probably also form a part of the diet of the Tortoises (*Testudo hermanni* Gmel.), a small specimen of which we saw in the mountains. These were the chief insectivorous vertebrates we noted: possibly owing to their silence, birds seemed to be non-existent.

These were the conditions five kilometres outside Bastia, in which most of our work was done. Farther down the coast huge heather plants

(*Erica* sp.) grew to a height of ten feet or more, Eucalyptus trees lined the roadside and the cultivated fields contained artichokes or Grape-vines. As one progressed westwards into the mountains the Cork-oak (*Casuarina* sp.) became dominant. Plantations of a kind of bamboo, and reeds and sedges formed the vegetation if instead one went eastwards, towards the sea. Seagulls occurred sparsely here. A more detailed analysis of the chief vegetational patterns, and of the vertebrates predatory upon insects, was impossible at the time.

The butterflies

Fam Satyridae

Pararge aegeria Linn. ssp. *aegeria*. The six specimens collected were taken in the dappled shades of the densely-clothed gullies where the Clematis rose to meet the trees.

P. megera Linn. var *tigelius* Bonelli. The few specimens taken were in poor condition, probably being at the end of their flying period.

Hipparchia arastaeus Bonelli. With *C. corinna* (below), formed the chief inhabitant of the Composite/grass 'open terraces'. Though quite an energetic species when on the wing, it spent most of its time in prolonged siesta on the bare patches.

Maniola jurtina Linn. A few only were taken.

M. ida Esp. The females of this species were rather like a large and more glorious edition of our *M. tithonus* Linn. Mainly to be found in rank, shady vegetation.

Coenonympha pamphilus Linn. Numerically speaking, this was a poor second to the following species, though still in good order.

C. corinna Huebn. The bright golden spots on the underside made this a particularly fine species to examine closely. It seemed to be a lazy flier, often trickling through the air for no more than a few seconds before flopping listlessly to earth.

Fam. Nymphalidae

Vanessa atalanta Linn. and *V. cardui* Linn. The latter was more common than the former in the open places, but both occurred at Buddleia flowers.

Aglais urticae Linn. ssp. *ichnusa* Bonelli. This insect was regrettably not encountered in the perfect stage, though a single larva was discovered.

Polygonia c-album Linn.

Argynnis lathonia Linn. This was absent from the list until we discovered a Buddleia bush, to which five or six specimens came during one afternoon.

Argynnis paphia Linn. and ab. *valezina* Esp. Males were seen infrequently flying down the gullies, and eventually a female was taken feeding on the Composite flowers.

A. pandora Schiff. A specimen of this fine insect was noted on average about every two days. They were mainly fairly worn males. Far more than we ourselves took with our nets were simply picked from flowers by a seven year-old girl who specialised in collecting this species for us!

Charaxes jasius Linn. See note 2 below.

Fam. Lycaenidae

Aricia agestis Schiff. Appeared to be well-distributed.

Lycaena phlaeas Linn. No normal specimens recorded. About ten of the dark form, ssp. *eleus* Fab. and one specimen of var. *coeruleopunctata*.

Lampides boeticus Linn. Not infrequent. One pair taken in cop.

Syntaracus telicanus Lang. Difficult both to see and to capture. Habitually flew erratically at the same height as the spiky Composites grew to.

Polyommatus icarus Rott. In about equal numbers to *A. agestis*. See also note 1.

Philotes baton Bergstr. A single specimen taken on August 17th.

Celastrina argiolus Linn. Common in shady places, especially Casuarina copses.

Fam. Papilionidae
Iphiclides podalirius Linn. Quite abundant. One larva found on *Prunus* sp. near Solenzara, on Sept. 3rd.
Papilio machaon Linn. Extremely common on the terraces. Condition variable. One egg laid on Foeniculum sp. on August 18th.
Fam. Pieridae
Pieris brassicae Linn., *P. rapae* Linn. and *P. napi* Linn. Fairly sparsely scattered individuals.
Pontia daplidice Linn. Found fairly commonly on the terraces.
Gonepteryx cleopatra Linn. Frequent in the gullies.
Leptidea sinapis Linn.
Colias hyale Linn. Two specimens. One female found depositing an egg on Lucerne (*Medicago* sp.), on August 24th.
C. croceus Fourcr. Considerably more common than the last species, mainly on the terraces.
Fam. Hesperiidae
The following species occurred, but none were common: *Carcharodus alceae* Esp., *Pyrgus malvae* Linn., and *Hesperia cirsii* Rambur or *H. serratulae* Rambur.

Notes:

1. *Polyommatus icarus* Rott. (Lycaenidae). On the evening of August 11th, after a hot tiring day in the mountains, we moved off up a green gully in which a trickle of water supported a dense growth of green vegetation beneath a canopy of Cork-oaks. The sun had already disappeared behind the mountain tops when we reached an ancient terrace covered with deep grass and a species of Leguminous plant (Papilionaceae) growing to a height of two or three feet. As we walked among the latter, we put up Common Blues in such numbers that it was impossible to count them. Where they were resting we could count between ten and twenty on almost every sprig of the plants, however, and my companion, walking in front of me, was literally surrounded by the flitting insects. It seemed incredible that so large a population could exist on that single terrace in numbers far greater than I have ever seen in any other species. The females resembled *A. agestis* in bearing no trace of blue colouration on the upperside, but the males appeared to be perfectly normally patterned.

2. *Charaxes jasius* Linn. (Nymphalidae). Specimens of this magnificent insect, which is said to have originally hailed from Africa, were not seen until we had almost reached Solenzara on our short trip down the east coast. They were thus situated at about 90 km. south of Bastia. Females were seen almost in abundance where the foodplant, the Strawberry-tree (*Arbutus unedo* Linn.), was growing in profusion at the junction of a field with a wood. The climax to that particular afternoon came when I was able to watch a female depositing a single round, yellow egg on a leaf of one of the smaller bushes. A male was captured as it settled on a mound of dung and a female was scooped into the net as she skimmed low over a pile of rubbish at the edge of a village. A further specimen was observed imbibing the sap oozing from the trunk of a Cork-oak, and to judge from the number of other specimens which attempted to visit that tree as we stood close by, this source of nourishment appears to be popular with the species. The butterfly is a powerful flier and from the thirty or more individuals which we saw, only four were taken. Regarding roosting habits, we saw one settling down at dusk on the flaky bark high up in a Eucalyptus tree.

3. *Acrida mediterranea* Dirsch. (Orthoptera: Acrididae). This fascinating insect—looking like the result of a grasshopper-stick-insect matrimony—favoured the surface of the road running south as a resting place,

and was either green or grey in colouration (developmental stages?). When disturbed, it would leap into the air and glide gracefully for thirty yards or more, to disappear eventually into the grass, the epitome of camouflage. One specimen which we have in our collection measures 10 cms ($4\frac{1}{2}$ in.) from wingtip to wingtip. It is an adult and grey in colour.

4. Ants (Hymenoptera: Formicoidea). The various kinds of ants encountered have still to be identified by us, but there was considerable radiation among members of the group. One species of about the size of our Wood-ant (*Formica rufa* Linn.) had holes in the baked ground and its workers spent the day scurrying along well-worn trails, one trail per nest, carrying bits of twigs and grass. Outside each hole a great heap of material had been gathered, to what purpose I just don't know, as the ants appeared to live underground. A smaller, brown species, with a black head, had trails going up and down the Orange tree beneath which we ate our meals. When provoked, this ant would curl its abdomen over its back and squirt out a blob of white fluid of an apparently innocuous nature. A third species held orgies in our opened "creme de marron" tin, and there were occasions upon which it was easier to "go aboriginal" and scoff the lot rather than try to pick out the bloated bodies from the brown paste. A fourth variety had a predilection for 'Bonbel' cheese and was brown in colour, thus enabling it to be distinguished from the black "marron-raider". A further species was of pin-head proportions, and must have studied under Napoleon, who was born on the other side of the island. In less than an hour these diminutive insects could disperse themselves thoroughly through the innards of a French loaf, from which they could only be removed with a lighted match applied to each slice. Grilled "pin-head" ants and stuffed "marron-ers" formed an essential component of one's staple diet. The diminutive one lived in the ground, but its capital was never discovered, though we searched diligently every time the kettle rose to the boil.

5. Hawkmoths (Lepidoptera: Sphingidae). The Hummingbird Hawkmoth (*Macroglossum stellatarum* Linn.) was a regular visitor to the brown composite blooms, as well as to other flowers. Only one other species of the family was discovered. This flew up from the road one morning, necessitating a thirty foot climb up a practically sheer rock face. We identified it at the time as a worn example of a Privet hawkmoth (*Sphinx ligustri* Linn.), but we subsequently reflected that it had borne not a trace of pink colouration, and I have been haunted ever since by the fear that it may have been a Convolvulus hawkmoth (*Herse convolvuli* Linn.). The date was August 23rd, if that would be of significance.

6. *Kalotermes flavicollis* Fab. (Isoptera). A small nest of this European termite was dug out from a rotting log obtained from one of the gullies.

7. Other insects. It is unfortunate that I have been unable to find time to get down to identifying many of the other insects which we brought back, but the following were of particular interest. The Great Green Bush-cricket, *Tettigonia viridissima* Linn., which was common in Northern France, appeared to be replaced in Corsica by the Great Grey Bush-cricket, *Decticus albifrons* Fab. *Oedipoda coerulescens* Linn. and *O. germanica* Fisch, were represented and easily separable (the former having blue hindwings, the latter pink), but the various kinds of *Platycleis* spp. proved to be very difficult. *Mantis religiosa* Linn. and the stick-insect, *Clonopsis gallica* Charp. were quite easy to find.

A frequent visitor to the Composite blooms was the large metallic-blue bee, *Xylocopa* sp. The paper-making wasp, *Polistes* sp., could be found in numbers feeding greedily from the white flowers of a common bush. Its nests, containing less than twenty cells, were usually found attached to grass stems. A large black spider-hunting wasp preyed on a certain kind of tunnel-dwelling spider, the latter attempting to protect itself by closing the silk-lined lid of its tunnel, and holding on with all its force from the inside. A certain variety of brown and yellow striped spider, as large as a *Tegenaria* sp. lived in webs two or three feet in diameter down in the coastal marshes around the 'Etang de Bigouglia'. Scorpions (*Scorpio occitanus* Latr.) gathered on the inside walls of the out-door toilet after dark, but hid under damp stones during the day-time. Lastly the Human Flea, *Pulex iritans* Linn., built up a thriving colony in our sleeping-bags and provided a souvenir of the trip that my mother didn't appreciate!

In conclusion, I would stress that I have barely scratched the surface, either in collection or in script, of the many fascinations of the insect fauna on this Mediterranean island, and if there is a lucky Member who is able to pay Corsica a visit in the future, if he would like to borrow my diary of the trip, I should be only too glad to pass it on to him for a week or two.

4.5.67. Leigh Plester (2968).

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BUTTERFLIES IN THE CRIMEA U.S.S.R., 1967

From 2nd to 22nd August I spent a holiday with my parents in a country house about thirty-five miles from Yalta, in the Crimea. The house was situated on the coast of the Black Sea, and the surrounding area had a "Mediterranean"-type climate. Most of the countryside around was covered in trees, dominated mostly by cypress (*Chamaecyparis* sp.), oak (*Quercus* sp.), Juniper (*Juniperus communis* Linn.) and *Acacia* sp. The trees and grass around our house were watered each day at 6 a.m. with large hoses, as were the large flowerbeds behind the house. As well as wooded areas, there were many small grass fields dotted with trees.

Unfortunately, moth-collecting posed some problems. Firstly, I had no torch with which to collect by searching, and I could not reach to collect moths that were dazzled by road lamps. I did manage to collect a few species of moths but I did not catch enough species to warrant their inclusion in this article, which I therefore confine to the Rhopalocera of the area. During the three weeks of our stay I kept a daily list of the butterflies which I saw, but the list is too long to be included here. I should however be pleased to send it to any reader requiring a more detailed account of the trip.

Throughout the entire holiday I noticed the remarkable scarcity of the Nymphalidae—only three species were seen. The other families—Satyridae, Lycaenidae, Pieridae and Hesperiidae—were all abundant. (One member of the Papilionidae was also seen.)

I shall proceed with the Satyridae, six species of which were noted. The Meadow Brown (*Maniola jurtina* Linn.) was rather scarce and seemed to confine itself to shade under trees; on the 10th I saw it in fair numbers with the Speckled Wood (*Pararge aegeria aegerides* Staud.) in a small patch of deciduous wood of mainly

Horse-chestnut trees (*Aesculus hippocastanum* Linn.). The Speckled Wood was found in the thickest part of the wood, in such a position as to render capture extremely difficult. Very little light made its way through the thick undergrowth and trees, and I found that I could hardly move without hitting branches and bushes, let alone use a butterfly net.

The Wall (*Pararge megera* Linn.) was extremely common—the most common butterfly I saw. It was to be found on all the paths and roads sunning itself, and on the large flowerbed behind the house.

In the middle of a patch of woods was a big stagnant pool. This was surrounded by willows (*Salix* sp.) and plane trees (*Acer* sp.), and the grass around was kept damp by a fountain which sprayed at intervals. The fountain was situated beside the pool in a shaded piece of ground canopied by plane trees, and the surrounding bushes were covered in Ivy (*Hedera helix* Linn.). The gravel-surfaced path near the fountain and parallel to the pool was very damp because of the fountain, and to this patch many species of butterflies came to drink. Three times I caught the Grayling (*Eumenis semele* Linn.) visiting this patch. This was the only place I saw this species, although many of the surrounding fields had large boulders which I thought would have been suitable localities for it. None, however, were to be found there.

Another species of Satyrid, *Hipparchia statilinus* Hufn., was very common in the open fields of the area. This insect's habits are quite similar to the Grayling's (in Ireland!). It was found resting on large rocks and on the flower heads of the *Eryngium* species. It is a strong flier and not too easily caught.

The most spectacular member of the Satyridae which I met with was *Brintesia circe* Fab., a magnificent insect which was quite common. On the edge of the wood in which I took *Pararge aegeria aegerides* and *Maniola jurtina* was a clump of fairly big Horse-chestnut trees. These trees were leaking sap and were visited quite often by *Brintesia circe*. Catching these was quite a problem. They were generally located about twenty feet up and were impossible to reach with my handle-less kite net. It was useless waiting for them to fly, as when they did—which was not very often—they only moved from tree to tree and quite out of range. My method of capturing them was fairly successful. I would get under a tree and give the trunk a sharp jar with my hand; if the insect was present it would glide down to a height of approximately four feet from the ground and fly swiftly away. I caught several specimens with my net as they glided down. I also took this species as it sucked moisture from the damp ground beside the pool. The lights in our rooms were covered with inverted cup-shaped lampshades. These were filled with dead moths and I was very surprised to see two specimens of *Brintesia circe* in two of the shades. Moreover, one night about nine o'clock my father saw one of these insects which had come in through his bedroom window and was flying round the light near the ceiling. I should be interested to learn if this species is known to be a nocturnal visitor.

As I have said, I was surprised at the scarcity of the Nymphalidae in the area—only three species were noted and one of these was seen only once. This was the Comma (*Polygonia c-album* Linn.), and a very worn specimen of this species was seen flying beside a flowerbed. The Silver-washed Fritillary (*Argynnis paphia* Linn.) and *Argynnis niobe* Linn. both came to the damp patch of ground near the fountain. I observed three

specimens of each species.

Seven species of Lycaenidae were seen. The two most abundant species were the Common Blue (*Polyommatus icarus* Rott.) and the Holly Blue (*Celastrina argiolus* Linn.), both of which were very common. The Common Blue was found on flowers in flowerbeds and in open fields on *Eryngium* sp. The Holly Blue was found beside the pool fluttering around ivy leaves and visiting Elderberry (*Sambucus nigra* Linn.) flowers. This species often visited the damp patch beside the nearby fountain.

The Small Copper (*Lycaena phlaeas* Linn. form *eleus* Fab.) was scarce and localised—I only found it in one field in the entire area, a rather shaded grass field where I caught a few specimens. In the flowerbeds behind the house I took a single specimen of the 'Blue' *Philotes vicrama* Moore. This was the only example I saw. In the same flowerbed I took two specimens of the Chalkhill Blue (*Lysandra coridon* Poda) on 5th August, and one specimen of the Adonis Blue (*Lysandra bellargus* Rott.) on the 16th. The only other Lycaenid I saw was the Purple Hairstreak (*Thecla quercus* Linn.), which was also found at the damp patch and flying above the ivy-covered bushes in the vicinity. It was a fairly common insect but I was not able to catch a single perfect specimen, all specimens being worn.

The Pieridae were equally plentiful in numbers of species, of which five were seen. The Small White (*Pieris rapae* Linn.) was very common throughout the area, as was the Large White (*Pieris brassicae* Linn.). The Bath White (*Pontia daplidice* Linn.) was common in open fields on *Eryngium* sp. in the early part of the holiday, but became much less common towards the end, as did most other species. The Wood White (*Leptidea sinapis* Linn.) was very common in shady places, e.g., beside the pool under the trees, and I often found it feeding from the damp patch near the fountain. One species of 'Yellow' was found in the area. This was the Clouded Yellow (*Colias croceus* Fourcr.). *Colias croceus* was quite common over the whole area and especially in the flowerbed behind the house. Two specimens of form *helice* were caught on the aforementioned flowerbeds.

The Papilionidae were represented by one species, *Papilio podalirius* Linn. (the Scarce Swallowtail), eight examples of which I had the good fortune to see gliding over tall shrubs in open fields. All the examples I saw were at the very beginning of my stay and were rather worn—perhaps I had come at the end of its flight period.

The Grizzled Skipper (*Pyrgus malvae* Linn.) was common, as was *Spialia sertorius* Hufn. The Dingy Skipper (*Erynnis tages* Linn.) was quite common at the flowerbed and reasonably common in the open fields. The most common Skipper was *Carcharodus alceae* Esp., which was very plentiful at the flowerbeds.

4.10.67. M. Jeffares (3540J).

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A EUROPEAN HOLIDAY 1967

From August 30th to September 12th my parents, younger brother and I were travelling across Europe by car. The first day we crossed the Channel to France and from Calais went south-east to spend the night at Reims. During the drive from Calais to Reims I noticed only 'whites' (*Pieris* spp.) and the Small Tortoiseshell (*Aglais urticae* Linn.).

The second day we were heading

for the Swiss border, and after a morning's drive stopped for lunch at Joinville. We decided to have a picnic in a nearby field, and my entomological holiday started with the sighting of a Pale Clouded Yellow (*Colias hyale* Linn.). During the stop for lunch four of these were taken, and many more seen. The Clouded Yellow (*Colias croceus* Fourcr.) was also seen, the Adonis Blue (*Lysandra bellargus* Rott.) and the Common Blue (*Polyommatus icarus* Rott.) abounded. Other species noted were the Grizzled Skipper (*Pyrgus malvae* Linn.), Small Pearl-bordered Fritillary (*Clossiana selene* Schiff.) and larvae of the Swallowtail (*Papilio machaon gorganus* Fruhst.) of which I found three.

The next day, September 1st, we motored on, and stopped for lunch at Lausanne on the banks of lake Geneva. Even in the city, I noted Clouded Yellows and one Hummingbird Hawkmoth (*Macroglossum stellatarum* Linn.), the only one noted on my visit abroad.

September 2nd was spent among the Swiss Alps. When we stopped, I noted the following species at approximately 5,000ft. Small Heath (*Coenonympha pamphilus* Linn.), Common Blue, Clouded Yellow, Pale Clouded Yellow, Red Admiral (*Vanessa atalanta* Linn.) and Meadow Brown (*Maniola jurtina* Linn.). At about 9 o'clock that evening, we reached our headquarters for the next three days, Cadennabia, near Como, in Italy. My first Italian catch was a male Gypsy Moth (*Lymantria dispar* Linn.), which was on the hotel wall.

Cadennabia is a small town built along one side of a road. On the other side is Lake Como, and the Italian Alps tower overhead. I was rather disappointed at first as there was little grassland for insects. However, I set off with net, boxes, jars, tins and other entomological paraphernalia, rather nervous as the only Italian I could speak was '*farfalle*' (butterflies and moths). My disappointment was soon lost, for walking along a path to a chapel on the hillside, I came across about twenty buddleia bushes laden with such butterflies as Red Admirals, fritillaries, and giant Italian Satyrids. I returned to the hotel, greatly satisfied, urgently awaiting the next day to go right up to the chapel, because I had only got about 500 yards that afternoon.

The next day, September 4th, my dreams of full collecting-boxes were shattered, for a violent thunderstorm raged. However, I roamed the streets of the town on the other side of Lake Como, Bellagio; and was very pleased with my only catch of the day, a Colorado Beetle (*Leptinotarsa 10-lineata* Say).

Our last day in Cadennabia, September 5th, found me very unhappy, for it was still raining. Luckily, halfway through the morning the sun broke through and I set off up the mountain in sweaters and Wellington boots. I did not expect to find much on the wing. I caught the Satyrids *Brintesia circe* Fab., *Satyrus cordula* Fab. and *Hipparchia fagi* Scop. I also took the Adonis Blue, a fritillary (*Melitaea phoebe* Schiff.) which was very abundant on the lower slopes, Wall Brown (*Pararge megera* Linn.), Large Wall (*P. maera* Linn.), Pale Clouded Yellow, Dew Moth (*Setina irrorella* Linn.), Grayling (*Eumenis semele* Linn.) and Swallowtail. I also caught a Praying Mantis (*Mantis religiosa* Linn.). In the afternoon the whole family went up a mountain to about 10,000 feet. Here only three species were seen, one male Swallowtail, three Wall Butterflies and six Scotch Argus (*Erebia aethiops* Esp.). On the same day one of my Swallowtail larvae died, but the following day the other two pupated.

From Cadennabia, we travelled to Venice and then back towards Calais

to catch the boat on September 13th. My only other note of entomological value was made on the 12th at a small village between Chaumont and Chalons-sur-Marne. Clouded Yellows abounded, and the only female Pale Clouded Yellow was taken here. I also found a Praying Mantis egg-batch.

I took all the species that I wanted, except for the Hummingbird Hawk-moth, but with luck I will be able to return to Europe in 1968 and make up for this.

23.10.67. N. Cook (3962J).

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NOTES FROM A FINNISH DIARY—II

These notes cover the period October 11th 1966 to April 15th 1967 (see also *Bull. amat. Ent. Soc.*, **26:** 20-2). They thus concern that portion of the year which, entomologically speaking, presents few opportunities for making field observations—*viz.* the autumn, winter and early spring. Because this is my first year in Finland, however, I have taken pains to record everything I have seen, thereby slowly building up a pattern of insect activities throughout the year. I have as yet seen nothing spectacular, but I hope that the following notes will be of interest to Members who have never resided this far north in Europe (latitude 61°50′).

Snow fell spasmodically during early November, and on the 26th of the month the snow cover was 7-8 cms in that part of the forest of Pinsio which lies about 20 km to the west of Tampere (alluded to in Note number 1). The day was bright and sunny, though the breeze was rather chilly, the thermometer reading about —4°C. The area has been much disturbed by quarrying activities but there is a particularly nice westerly-facing bank to one of the older excavations. As I struggled up this bank through the snow I met, practically face to face, an insect which was waltzing calmly across the crisp surface on its long, thin legs. It looks like some form of pond-skater (Hemiptera: Amphibicoriomorpha) and when I have more time I shall try to identify it by means of a book which has recently come out here (Linnavuori, 1966). I was surprised to meet so sprightly an individual on the snow under conditions which made me want to keep on the move and which had reduced the winter-gnats (Diptera: Nematocera) to feebly struggling husks with their feet in the air. It is of interest to record that the intrepid excursionist, be it bug or whatever, passed away after three hours in the heat of my room (18°C). Presumably, one man's central heating is another's poison!

As the winter wore on, the little time I spent out of doors was taken up by trying to keep the frost from my beard. I think it is true to say that nothing moved in the mid-winter unless it had to, and that included this investigator.

Even whilst skiing through the forest, I saw nothing of interest, and I came in contact with enough spruce saplings to provide a reasonable cross-section of the available hiding-places for insects. My new method of beating—on the 'personal collision with the vegetation' principle—yielded nothing. By Christmas, daylight was reduced to a little over five hours, and the sun disappeared behind the snow clouds for a complete month. The coldest temperature for Tampere was recorded on January 31st, when it was —37°C two metres from the ground, and —41°C on the ground surface itself. It was impossible

to touch anything outside with the bare hands and as one breathed crystals of ice formed at the edges of one's nostrils. So much for the winter.

Towards the end of February, everyone was surprised at a sharp rise in temperature and when the latter had risen above freezing-point, a false spring was dolefully predicted. At first the thermometer fell by ten degrees every night, but gradually it got even warmer, and at the time of writing it has been +10°C at two o'clock in the afternoon. The snow melted, beginning with the roads, extending to the borders of these, then across the open places, and finally penetrating into the forests. Half-a-metre-deep snow does not disappear overnight, however, and there are still thick drifts in the shady places, so that it is not uncommon now to see a butterfly leave a flower and go winging away across an extensive patch of snow. A few metres away you might see a lizard (*Lacerta vivipara* Jacquin.) basking on a patch of dry earth.

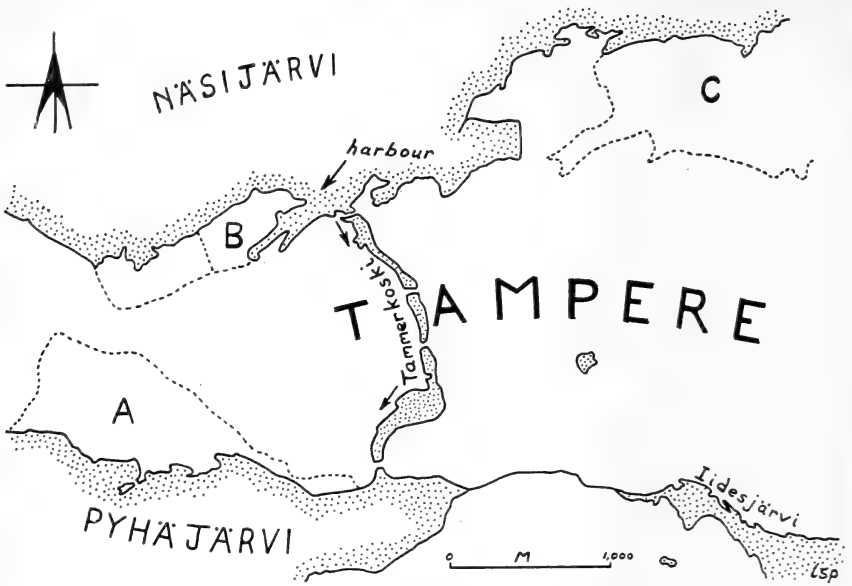
A torpid house-fly (*Musca* sp.) settled on my carpet on March 23rd and that same day we rejoiced to find three Coltsfoots (*Tussilago farfara* Linn.) bursting into bloom outside between two snow drifts.

I again paid a visit to my favourite quarry bank in the forest on March 27th, and found there more than a dozen 7-spot ladybirds (*Coccinella septempunctata* Linn.), sitting about among the folds of dead leaves, taking the sun. These, and the flies I watched basking on the wall of a wooden hut, were the first insects noted out of doors. I searched some Sallow bushes (*Salix caprea* Linn.) for the knobbly galls caused by the Hymenopteran *Euura amerinae* Linn. and soon found several. I hope eventually to be able to write something about the various kinds of plant galls found here, so I will not go into details about this species now. The careful separation of a pair of withered sallow leaves disclosed a pair of small, metallic green Chrysomelid beetles, which I brought home and placed in a match-box. Despite the higher temperature indoors, these have only very recently begun to move about. They are of interest as an example of a species which hibernates in the adult stage and when they have been identified, I shall pass on the information.

On March 27th the dome-shaped nests of the Wood Ant (*Formica rufa* Linn.) were devoid of insect life. By April 9th, however, they were swarming with workers, these being interspersed with larger soldier ants. It was while plodding across an open space between two of these ant strongholds that I came across a caterpillar walking across the snow. The nearest patch of exposed vegetation along its line of locomotion was more than twenty metres away, so I saved it a long walk by rolling it into a match-box. It was an Arctiid caterpillar of the *Spilosoma* type, and spun up three days later in a jam-jar that had originally contained Artic cloudberries—an appropriate pupation place to my way of thinking!

On April 9th I made a preliminary survey of a "rame", which is the Finnish name for a peat-bog dominated by small pines (*Pinus sylvestris* Linn.). There I met with two 'micros', the second of which obligingly settled on my brick-red pullover. This is another species which I have not yet managed to identify, which is a pity, as I have seen several more individuals since then and it would be interesting to know in what stage they survive the winter.

The sunniest three days of the period I am writing about commenced on April 12th, when the sky stretched bright blue from horizon to horizon



Plan of Tampere showing positions of Areas A, B and C

and the thermometer crept to 10°C. Insects and other animals must have benefitted considerably from this unusually early warm spell, particularly since the sun now rises shortly after five o'clock in the morning, and does not set until eight o'clock in the evening (East-European Standard Time). Having the afternoons of these days free, I set about reconnoitering three of the areas I had ear-marked for spring investigations.

Finland has forty-six cities and towns. Tampere (South-Hame district) is probably inferior in size only to the capital city, Helsinki, and lies on a narrow isthmus between two very large lakes—Nasijarvi to the north, Pyhajarvi to the south. The sketch-map is a plan of the town with the streets omitted. Areas A (Pyynikki ridge) and B (adjacent to the "harbour") are within ten minute's walk of the town centre. Area A was my destination on April 12th. I walked in a westerly direction along the narrow "beach" of Pyhajarvi, with the pine-covered ridge rising steeply up on my right, and a large expanse of solid ice stretching fifty metres across the bay to my left. I soon spotted my first Small Tortoiseshell (*Aglais urticae* Linn.) and shortly afterwards a male Brimstone (*Gonepteryx rhamni* Linn.) bobbed towards me in that characteristic manner which always reminds me of a dog stopping to sniff at every tree. On the following day, as I sat eating my lunch, another Brimstone scudded by at a distance, and this one appeared to be a female, though I could not unfortunately be sure. All the other specimens I have noted since have definitely been males.

I visited the second area on the 13th. This small territory is considerably more open than Pyynikki, though the dominant tree is again *Pinus sylvestris*. The terrain is extremely

rocky, and at the summit there is a small pond lying in a depression. At the edge of the pond a few stunted willows (*Salix* sp.) subsist on the shallow soil, so the pond is presumably at least partially permanent. In the faintly stinking pools between the yellowed grasses at the edges and the ice masses in the centre I could clearly see the females of the small Crustacean *Cyclops* sp., with their large lateral egg-pods. Whirligig beetles (*Gyrinus* sp.), gnat and mosquito larvae, and red water-mites (*Hydrachna* sp.) were likewise visible to the naked eye.

My real purpose in visiting this area, though, was to look for the Small Tortoiseshell butterfly. I had watched, on October 5th, several specimens visiting some late-flowering plants of the family, Compositae near the small wooden huts on the flat ground between the terraces of rock and the harbour on Nasijarvi. One or two of the butterflies appeared to be extremely interested in these ramshackle buildings and in the neat stacks of sawn birch-logs which are produced by the people working in the buildings. I supposed that the butterflies were seeking out places in which to hibernate, and I wondered whether the same individuals would be about again this April. I only saw one butterfly, however, in that quarter on April 13th. It occurred to me then that I had never read of anyone marking butterflies before hibernation, with a view to ascertaining whether they remain in the same vicinity in the spring, or move away to new territories. I have resolved, therefore, to mark any Tortoiseshells I find in Area B next autumn, using nail varnish, and to try to determine what happens to the recorded individuals after hibernation.

One thing is certain. The species is extremely common, in this part of Finland at least, as the large numbers of specimens I have seen this past week testify. It may be that the extreme dryness of the northern winter (everything freezeable freezing!) is conducive to successful hibernation. How many of these butterflies hibernate in out-houses, work-huts, etc., is not known, but a proportion certainly chooses houses, as I learned from a schoolteacher at Ruovesi, about fifty kilometres north of Tampere. She has had them hibernating in her house for many years.

The Kaupinoja Natural Park, which is my Area C, is a ten-minute car drive from the town centre, and is by far the largest and most natural habitat of the three. It extends across, and partly around, a hill composed of granite, and overlooks one of the bays of Nasijarvi which at the time of writing is a grey expanse of surface-wet ice. Its vegetation consists of Pine (*P. sylvestris* Linn.), Cedar (*Cedrus* sp.), and some Birch (*Betula* sp.) and Spruce (*Picea* sp.) in the tree layer, with *Calluna* sp., and *Vaccinium* sp., lichens and various oddments in the herb layer and lower layers. It also provides many Coltsfoots, which appear to be the principal flowers visited by butterflies at this time of year.

On April 14th the pretty, blue-flowering "Sinivuokko" (*Anemone hepatica* Linn.) had appeared at the edge of the forest overlooking a large, grassed plain. From one side of the plain a peninsula extends into the trees, and in one corner formed by the junction of this extension with the main body there is a group of birches, beneath which at the time some of the blue anemones were flowering. It was an idyll for the Small Tortoiseshell and when I arrived there were four basking on the ground, and two more flying about in an agitated fashion in the upper foliage of the trees. I watched these latter for some minutes, wondering

what they were looking for, but could draw no obvious conclusions from my observation. Then my attention was arrested by two male Brimstones which were sitting on the ground with their wings folded. The urge to catch the nearest of these in my hat came upon me. The traditional Finnish woodsman's hat is useful in having a fairly wide peak, enabling it to be gripped fairly firmly in the hand and used as a makeshift net, the carrying of which does not arouse undue comment.

I had just begun to stalk intently forward when a movement to my front made me stop, and I found myself to be the subject of a very suspicious stare. The girl who had previously been lying full length in the sun unnoticed by me was now sitting rigidly upright. I have actually no objection to being regarded as a maniac, but not knowing what kind of deranged individual the secluded young lady supposed me to be, I donned my makeshift net and beat a hasty retreat. I can only hope that she does not habitually use that peaceful spot, for it is by far the best place I have found for butterflies this spring!

15.4.67. Leigh Plester (2968).

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JUNIOR NEWS SECTION

Once again the summer is almost upon us and I bet like me you are unprepared. Perhaps this letter from Robin Crow (4087J) will get you into the insect seeking mood. He writes:

"I thought that you might be interested in the results of my recent trip to Yucatan, Mexico, so I enclose a short article and list of species of butterflies seen in the region. Yucatan is interesting because as far as I can make out there appear to be no records, in the entomological literature, regarding this part of Mexico.

"From December 23, 1967, to January 8, 1968 I stayed in Merida, the capital of Yucatan, Mexico. We travelled to Yucatan by plane, stopping off at Miami, Florida, for a few hours both going and returning. In Miami I took, along with several other species, *Danaus plexippus* Linn. (The Monarch) and *Urbanus proteus* Linn. (Long-tailed Skipper): these captures were interesting as I did not see these common neotropical species in Yucatan.

"The country around Merida is very dry, particularly as we were there in the dry season, because all the rivers are underground and only come to the surface as cenotes, large and very deep ponds. Vegetation consists of scrub jungle or chaparral broken up by large fields of sisal, a large spiky plant, from which twine is made. While we were there it was sunny most of the time, there was no rain and the usual day temperature was around 80°F.

"Yucatan is famous as the site of many ruined Mayan cities. The Mayans were the most advanced of all the Pre-Hispanic American cultures. We visited three cities, Dzibilchaltun, Chichen Itza and Uxmal. The latter was the most interesting both for its buildings and also for the different type of vegetation that I think is probably intermediate between the scrub jungles further north and the rain forests found further south in British Honduras and Guatemala.

"In all we saw about 101 species and captured 88 in Yucatan. Species seen which were positively identified are listed in *Table* I.

"I am leaving in a few days for Hawaii and hope to send in a report of my experiences there."

Table 1: Positively identified species seen in Yucatan. Number in brackets denotes probable number of species seen in that family.

Family Danaiidae (Danaiinae) Milkweed Butterflies (2)
Danaus gilippus (The Queen)
D. cresimus
Family Heliconiidae (Heliconiinae) (5)
Heliconius charitonius (The Zebra)
Agraulis vanillae (The Gulf Fritillary)
Dryas julia
Dryadula phaetusa
Family Satyridae (Browns) (3)
Euptychia pyracmon
E. rubricata
Family Nymphalidae (26)
Euptoieta claudia (Variegated Fritillary)
E. hegesia (Mexican Fritillary)
Vanessa cardui (Painted Lady)
Precis genoveva
Metamorpha steneles (The Malachite)
Anartia jatrophae (White Peacock)
A. fatima
Hamadryas fornax
H. feronia
Biblis hyperia
Limenitis fessonia
Dynamine dyonis
Anaea pithyusa
Family Lycaenidae (Blues, Coppers etc) (13)
Strymon melinus
S. columella
Leptotes cassius
Brephidium pseudofea (Eastern Pygmy Blue)
Hemiargus isola
Family Papilionidae (Swallowtails) (5)
Papilio polydamas
P. thoas (Citrus)
Family Pieridae (Whites etc) (20)
Anteos clorinde
Phoebis sennae (Cloudless Sulphur)
P. philea (Orange Barred Sulphur)
Euremea mexicana
E. boisduvaliana
E. nicippe (Sleepy Orange)
E. gundlachia
E. proterpia
E. daira (Barred Sulphur)
E. lisa (Little Sulphur)
Nathalis iole
Appias drusilla
Ascia monuste
A. josephina
Family Hesperiidae (Skippers) (23)
Chioides albofasciatus
Heliopetes macaira
Pyrgus syrichtus
Copoedes minima
Polites vibex

Even if you do not manage to get as far as Mexico please drop me a line just to let us know what you are doing this season.

As I had such excellent entries sent in for last May's quiz I thought you might like to try another. A small prize will be awarded to those of you who manage to obtain a high enough mark. When sending me your attempts (within two weeks of receiving your copy of the Bulletin), please say which of the following prizes you would prefer: an AES badge, a single copy of a *Bulletin* from the period 1949 up to the time you joined the society, live stick insects (Indian, Madagascan or Corsican) or provided I can get hold of it, any particular specimen you are after. Don't forget to include your full name and age on your entry.

1. What do adult Clothes Moths (*Tineola bisselliella* Hummel) eat?
2. Draw and colour a Rainbow Rove Beetle (*Paederus littoralis* Grav.).
3. Which 'metamorphosis' do each of the following Orders pass through?
   a. Coleoptera, b. Dictyoptera, c. Phasmida, d. Aphaniptera. The English names would be appreciated.
4. What do insects mainly use their antennae for?
5. Give three reasons why centipedes are not insects.
6. Which very rare butterfly is only found on the Isle of Wight and nowhere else in the British Isles?
7. What have bees and bugs to do with ruby lips?
8. Draw and colour an adult *Vanessa atalanta* Linn.
9. What is meant by a gynandromorph?
10. What are 'Anopheles' and are they found in Britain?
11. Give two Orders of insects which have back legs adapted for jumping.
12. Draw and colour a larva of the Pale Tussock Moth (*Dasychira*

pudibunda Linn.).
13. To which Order of insects do June bugs belong?
14. What in fact is a Stone Fly?
15. Draw and colour an adult Clifden Nonpareil (*Catocala fraxini* Linn.).
16. Name at least five of Britain's social wasps.
17. What had the beetle *Ateuchus sacer* to do with cats?
18. Draw a water scorpion.
19. Many insects live in symbiosis with ants. What does this mean?
20. In order to help the Nature Conservancy with their survey, where should you send your Lepidoptera records?

I am looking forward to hearing about the T.I.E.G. Riviera expedition and just itching to deal with your criticisms and ideas.

I wish you a happy season but take care not to overcollect!

30.1.68. H. J. Berman (2971A).

●

LETTERS TO THE EDITOR

Sir,—I would like to support very strongly the views put forward about the effects of light-trapping by Mr G. S. Robinson in the November issue (*Bull. amat. Ent. Soc.*, **26**: 136). I have been operating a light-trap in my garden from March to December, except when away from home, for fifteen years. There has been no general diminution in the number of moths trapped, other than the normal ups and downs due to weather conditions, etc. Indeed, some species are definitely more numerous than they used to be.

Of course, I am careful to keep the trap running during the day in a secure place and open it at dusk, when the moths fly out naturally. This, I think, actually saves lives, as the moths are safer in the trap than they would be resting in the open.

The prolific use of modern insecticides, and the great increase in the small bird population are, I am sure, much more destructive than the sensible use of a light-trap in the garden.

16.11.67. Sir Robert Saundby (1817).

Sir,—I wish to report the sighting of a Pale Clouded Yellow (*Colias hyale* Linn.) in a field by the river Cuckmere at Arlington, Polegate, Sussex.

The butterfly was sighted late in August by myself and my brother: the upperside markings and white yellow-green tinged colour showed clearly that it was a female Pale Clouded Yellow. A subsequent study of plate 21 in South (1941), confirmed this.

2.9.67. Peter Mobbs (3956J).

REFERENCE

SOUTH, R. (1941). *The Butterflies of the British Isles.* Frederick Warne, London.

●

NOTES AND OBSERVATIONS

POISONOUS PEACH

Our gladioli were being stripped as usual this year, by some pestilent noctuid whose egg-batches I had not kept adequate watch for. Eventually I found a few of the small caterpillars skulking low down, waiting for the

protection of darkness. 'Macro' larvae show only the primary sensory setae and very little pattern in the first instar, so I had to rear these wee green chaps with the black warts until I could recognise them. A couple of moults later, I recognised one of my old enemies, *Mamestra brassicae* Linn., the Cabbage Moth.

One night, I did not want to get wet picking pelargonium leaves for the larva that I still had, so I put in a peach leaf (*Prunus persica* (Linn.) Batsch). For 24 hours the leaf was untouched, then the larva nibbled little bits off all round the edge, rejecting them so that they littered the box. Within three days the larva was dead.

I had always noticed that the leaves of this 'Yellow Cling' peach tree were untouched in the garden. It gets little leaf curl from aphids. The unripe fruits are freely pierced in some years by Miridae. The gummy exudate from the wounds makes a mess, but the fruit is unharmed internally. Gummy sap also exudes from the trunk, where it is attacked by *Enarmonia formosana* Scop. (*woeberiana* Schiff.). The sap is thus not poisonous, but there must be something toxic to insects that is present in the leaves.

R. W. J. Uffen (1660).

●

LONG-TAILED BLUE IN LONDON

On 18th October 1967 I had the good fortune of catching a Long-tailed Blue (*Lampides boeticus* Linn.) in my back garden at Finchley, London N.12. I have had this certified by two other collectors. I would be interested to know how many, if any, other specimens have been caught this year.

L. Smith.

●

THE SMALL SKIPPER BUTTERFLY

I wonder if other AES Members have noticed the very great increase in the number of Small Skipper butterflies (*Thymelicus sylvestris* Poda) this year? In my entire collecting area, and also in parts of Middlesex I have visited, these butterflies now greatly outnumber all other species, including the Small Tortoiseshell (*Aglais urticae* Linn.), 'Browns', etc., and in most places it would be impossible to count them. Only a few years ago I remember seeing my first Small Skipper in this area, and was quite excited at the time, whereas now one would almost think it was the only species.

12.8.67. Wesley Caswell (3133).

●

HOMING DEVICES

This year a friend and myself marked several Poplar Hawkmoths (*Laothoe populi* Linn.) which were caught in our own moth-traps. He marked his with blue paint and I marked mine with red paint. He lives about a mile away from me and we arranged to release each others' moths at our houses.

I was rather surprised that after the night that we exchanged and released our moths, we both recaught some of our own marked moths in our moth-traps. If anyone has had experiences with other moths on this subject,

would they please let me know.
8.12.67. D. J. Longman (4042J).

●

PHORACANTHA TRICUSPIS NEWMAN

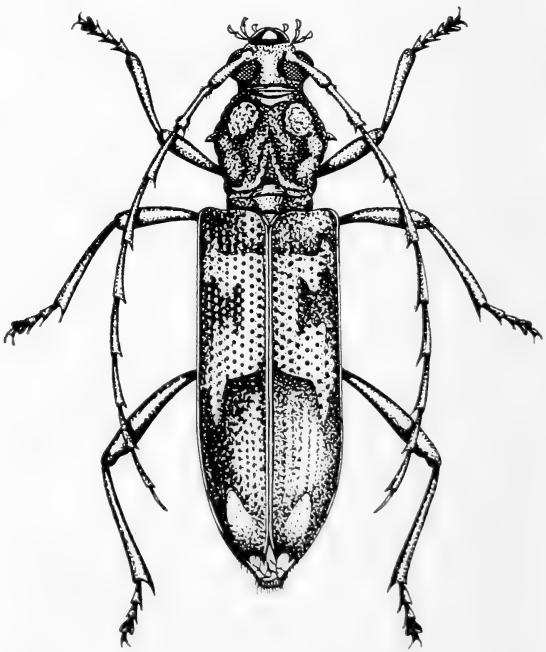
Cerambycidae
Phoracanthini
Phoracantha tricuspis Newman

The natural size of this beetle varies from 2.5 to 3 cm. The basic coloration of this species is red-brown, legs and underside covered with short pale yellow pubescence. The elytra are red-brown with black and ochre markings.

The specimen from which the drawing was made was sent to me by Mr K. Dansie of Broken Hill, New South Wales, and was caught at Broken Hill in September 1965.

The species has been described by Newman (*Entomologist*, **1**: 3) and further work has been carried out by E. A. J. Duffy (1963) in his '*A Monograph of the immature stages of Australasian timber beetles* (*Cerambycidae*)' published by the British Museum (Natural History), in which there are references to earlier accounts of the biology of this species.

I would like to thank Mr K. Dansie for sending me the specimen and Mr R. T. Thompson of the Department of Entomology at the British Museum (Natural History) for supplying the information in the paragraph above.
27.1.68. Jonathan Cooter (3290).



Phoracantha tricuspis Newman

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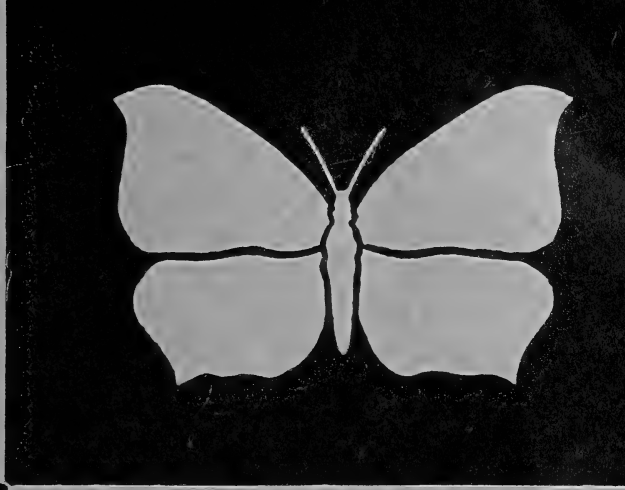

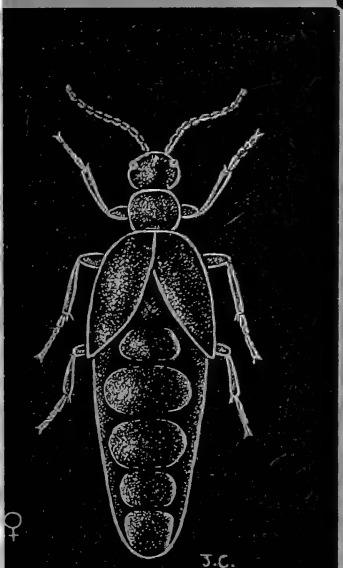

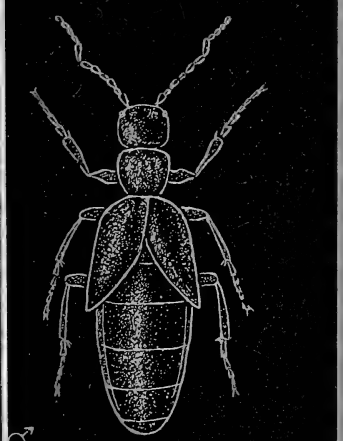

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EDITED by DAVID CORKE, B.Sc., L.I.Biol.

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The Amateur Entomologists' Society

Published August, 1966 PAMPHLET No. 11

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AES
BULLETIN

No. 280
AUGUST, 1968

EDITORIAL

Mr Danks has edited the *Bulletin* for the last six years and I am sure that members will agree that during his editorship the *Bulletin* has improved greatly and has now reached the highest quality in the history of the Society. It is therefore with some trepidation that I take over as Editor. Mr Danks spent many hours explaining the intricacies of editing to me and I hope his explanations have had the desired effect; but if the standard of editing is not what you have come to expect please bear with me and do not hesitate to point out my mistakes. Doubtless trial and error will, as usual, be the best teacher.

Members can help to ease my task by supplying lots of articles and short notes. For the longer articles, at least, please try to follow the Guidance for Authors in the November 1966 *Bulletin* (Bull. amat. Ent. Soc. 25: 109-12) as carefully as possible. I do not plan any great changes in the *Bulletin* organisation and these notes will still be the guidelines both for me and you, the writers of the articles. If you are preparing illustrations which require lettering and cannot do this yourself with a 'Letraset' please put the labels on in light pencil only.

The 'Latin' names controversy has raised its head again, (See Letters to the Editor). I do not propose to change the editorial policy on this matter, for the majority of articles but please be careful not to imply too great an accuracy in attempting to name every organism specifically. If you only identified the organism approximately, then just give its generic or family name. For articles which are of literary interest, which describe the enjoyment you get from entomology but with no idea of presenting scientific information, then it would be foolish to insist on scientific names. Occasional articles of this type will be welcome—we can't be serious scientific observers all the time; but I hope that the majority of papers submitted will still be of sufficient scientific interest to merit accurate identification (by 'latin' names) of the organisms mentioned.

May I take this opportunity to wish you enjoyable holidays and to remind you to take your notebooks—both to record observations of interest for the *Bulletin* and to record all the Lepidoptera that you see for the National Distribution Scheme. Many holiday areas in the British Isles (especially Eire) have few 'native' entomologists and holiday records will be most important. Talking of Irish distribution records it is a great pity that the Biological Records Centre still uses the extension of the British National Grid foolishly invented by the Botanical Society of the British Isles. This grid is not the one on Irish maps as Ireland has its own National Grid. So far only the Mammal Society has had the sense to record Irish records on the Irish grid.

David Corke (2962).

Front cover illustration: The oil beetle, *Meloe proscarabaeus* Linn., drawn by Mr. J. Cooter (3290).

ANNUAL EXHIBITION 1968

The Annual Exhibition will be held on Saturday 5th October at the Hugh Myddelton School, E.C.1. Further details will be found on the back cover.

•

COUNCIL'S REPORT 1967

Business of the Society. During 1967 the Council met on six occasions under the Chairmanship of the President, Mr P. W. Cribb. Mr G. Prior took up his duties as General Secretary of the Society. The year can be looked upon as one of steady progress. The membership of the Society rose to a total of 750 members, despite some misgivings that may have been felt over the policy of withholding the *Bulletin* from non-paying members and sending out a reminder in lieu of the February *Bulletin*.

Bulletin. Thanks to the efforts of the Editor, Mr Hugh Danks, and our printers and a steady flow of contributions from members, the *Bulletin* appeared on time each quarter and the quality of its contents has been well maintained. The *Wants and Exchanges Lists* also appeared regularly and showed an increased usage by members.

Publications. A pamphlet on stick insects by Mr W. J. P. Crotch has been prepared under the editorship of Mr R. Uffen, our General Editor, and this will be published in the coming year. The Council's decision to raise the prices of our publications to a more realistic level has had, generally, a satisfactory result. Sales of the Coleopterist's Handbook and the Silkmoth Rearer's Handbook have increased and though some of the *Leaflets* and *Pamphlets* have not sold so well, the increase in the revenue from the sales of Publications is a helpful and healthy sign. Sales of back numbers of the *Bulletin* have risen modestly and the Society must express its thanks to Mr L. Christie, our Publications Agent, for his invaluable help.

Meetings. The Annual Exhibition must be described as a success. The attendance was very high, over 700, and the Council must turn its attention to the need for larger premises. The number of tables rented by dealers and others was increased and the standard of exhibits was improved, the emphasis no longer being on collecting alone. The St Ivo School was with us again, the Zoological Society and a team from the Nature Conservancy Lepidoptera Survey were also present. Mr B. Skinner is to be congratulated on the organisation of the event.

Groups. During the year discussions between the Council and the Lepidoptera Breeding Group resulted in the formation of a new group, the Conservation Group, which will incorporate the Breeding Group, and Mr K. J. Willmot is to act as Convenor. There was a revival of the Silkmoth Rearers' Group under Mr C. J. Hamilton. This Group sends out a bi-monthly circular to members and mounted a stand at the Exhibition. Mr H. Berman continues to act as the focus for Junior members and their interests.

Field Meetings. One field meeting was held at Hatfield Forest and details of other Societies' meetings were circulated to members. The Council agreed to give publicity to field meetings of County Trusts and similar bodies by giving the names of organisers in the *Wants and Exchanges*

Lists. It is hoped that more entomologists will thus take an active part in local field meetings in their own areas.

The Council records the deaths of some of its older members during the year:— Prof. Balfour-Browne, an Honorary member, and Messrs A. Pow, C. W. Gyselman, H. J. Cribb, R. R. Broome and F. R. Sutton. All had been keen supporters of the Society for many years.

The Council wishes to record its thanks to all the officers and other members of the Society who have helped in making the past year a successful one. The year has seen an awakening of a greater interest in the Society's role in the field of conservation. The need for our Society becomes greater each year; training young people in the right methods and encouraging their interests—the best guarantee that there will be enough people in future years who will care whether we have an insect fauna or not.

●

ANNUAL GENERAL MEETING 1968

The A.G.M. of the Society was held in the rooms of the Linnaean Society at Burlington House on Saturday 23rd March. The formal business was preceded by a conversazione and the showing of two excellent films made by Mr and Mrs Beer. These were on the lives of the Brimstone and Purple Emperor Butterflies. The commentary was spoken by the President, Mr P. W. Cribb. It was generally agreed that the quality of these two films, made entirely by amateurs, was outstanding, recording as they did the intimate scenes in the lives of these butterflies. The report of the representative of our Society on the Nature Conservancy Entomological Committee was read. (This report is published below). The report of the Council, for the preceding year, was circulated among members present, put to the meeting and adopted unanimously. The Treasurer regretted that he was unable to read the financial report for the year, as the Audit was not yet complete. He stated that the report would be circulated with the *Bulletin* as soon as possible. The election of Officers and Councillors, for the ensuing year, then followed. The nominations were:—

President	B. R. Stallwood
Secretary	G. Prior
Treasurer	P. Lindsley
General Editor	R. W. J. Uffen
Assistant Treasurer	B. R. Stallwood
Advertising Secretary	R. D. Hilliard
Exhibition Secretary	B. Skinner
Field Meetings Secretary	R. H. Allen
Youth Secretary	H. J. Berman
Enrolment Secretary	D. Dodwell
Bulletin Editor	H. V. Danks (D. Corke after the May issue)

Councillors retiring by rotation and nominated for re-election were: P. W. Cribb, R. D. Hilliard, B. Skinner, P. Taylor, R. W. J. Uffen, and R. J. Cooter. D. Corke was nominated from the chair as Councillor and C. Penney and M. Wilson as Junior Councillors. All the Officers and Councillors nominated were then unanimously elected. Mr P. W. Cribb vacated the chair and Mr B. R. Stallwood was installed as President. The President then proposed a vote of the thanks to Mr P. W. Cribb for his excellent work as President for the last two years, this was carried unanimously. The appointment of Mr W. J. Beer and Sq. Ldr. Grey as Auditors was then proposed and

carried unanimously. It was pointed out, from the chair, that the Society was at present without Trustees, and the Council recommended that Air Vice Marshal Sir Robert Saundby, K.C.B., K.B.E., M.C., D.F.C., A.F.C., D.L. and Baron C. G. M. de Worms, M.A., Ph.D., F.R.I.C., F.R.E.S., be appointed as the Society's Trustees, this was carried unanimously. A vote of thanks to the Council for their work during the preceding year was proposed by Mr F. Brown and carried unanimously.

Under other business, which followed, there came a general discussion in which most of the points raised came from junior members. Among the points raised were the activities of the present groups within the Society and the possibility of reviving others, such as the reading circles and the London Meetings Group. The meeting closed at 5 p.m.

●

THE ANNUAL REPORT OF THE SOCIETY'S REPRESENTATIVE ON THE ENTOMOLOGICAL LIAISON COMMITTEE OF THE NATURE CONSERVANCY

Your representative attended the only meeting of this committee held in 1967 on the 7th March at Belgrave Square.

Amongst the matters discussed were the study and control of the Wood Ant (*Formica rufa* Linn.) in the Blean Woods Nature Reserve and the future work of the Biological Records Centre at Monks Wood, where a scheme for mapping the distribution of British Lepidoptera is well under way. A lengthy discussion took place concerning the difficulties in publication of the results of surveys carried out on behalf of the Conservancy in its reserves.

Towards the end of the meeting the Deputy Director said that he was inviting all members of the Conservancy's Liaison Committees to review their role and functions, apparently with a view to stream-lining the work done by the various committees. In view of the seriousness of this, it was unanimously decided to hold a special meeting on April 18th to discuss this whole matter. This meeting was postponed due to the 'Torrey Canyon' disaster till May 17th but was then never held. It would seem without doubt that the Conservancy has now wound up its Entomological Liaison Committee though your representative has heard nothing officially! In his opinion this is a serious blow to entomological conservation and a retrograde step for, and not by, those who have striven to further the interests of entomological conservation. Direct contact with the one *official* body concerned with conservation will be lost, or at least informed and strongly held opinion will tend to be diluted due to the presence of only one or two intermediaries on any future committee.

In order to fill the hiatus thus created, moves have been taking place to set up a broader based conservation committee by the Society for the Promotion of Nature Reserves, with representatives from various societies such as the Botanical Society, the R.S.P.B. and the Royal Entomological Society to replace the various liaison committees of the Nature Conservancy. In order that entomological interests may be catered for the Royal Entomological Society's Conservation Committee is likely to be replaced by one with representatives drawn from various other entomological bodies but the exact constitution of this has yet to be decided.

In conclusion it would appear not

inappropriate for the writer of this report to express the great pleasure he has had in serving the Society as its representative on the Liaison Committee for the last ten years.

T. G. Howarth.

●

COLLECTING NOTES AUGUST 1968

The Smaller Moths

Anagasta (*Ephestia*) *kuehniella* Zell. Mr Bradford's note reads as follows: "I was originally given half a pound of meal from a bakehouse by a friend who informed me that it contained larvae that would turn into moths. Eventually I did breed hundreds of them. They can become quite a pest in many stored products. This bakehouse had been treated a number of times by infestation officers, but after a time had elapsed the moths had reappeared. I have also bred specimens from a compacted lump of seed intended for the hampsters in a local pet shop.

"The forewings are a dark greyish brown with darker blackish markings, and rather speckled all over with blackish scales. The hindwings are a pale translucent grey-brown with dark edges and distinct veining.

"The adult is on the wing from about the end of June until October.

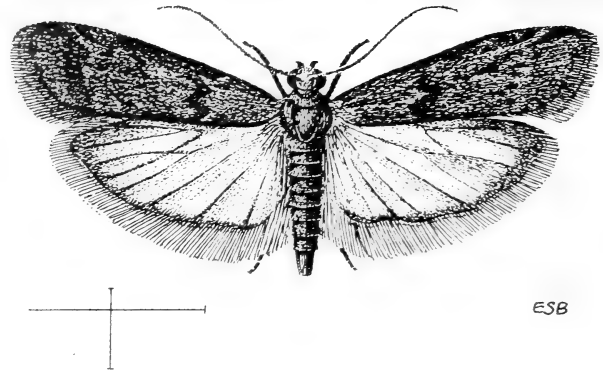
Ypsolophus (*Cerostoma*) *alpellus* Schiff.

Mr Bradford writes: "The head is ochrous. The forewings are brown-ochrous-grey with a finer, slightly darker, mottling over the wings; there are two definite, darker brown streaks from the dorsum. The hindwings are grey, sometimes darker than the forewings and darkening towards the edges. The larva feeds on Oak (*Quercus* spp.) in June and pupates in an ochrous-coloured cocoon under a leaf or in crevices in the bark. I have taken several pupae from the bark of an Oak and they were quite easy to see against the darker background."

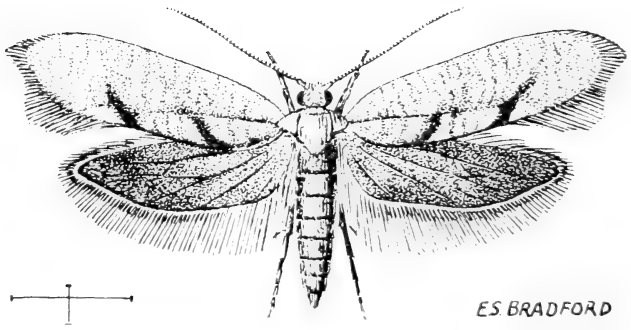
The moth flies in August and may be disturbed from foliage in oak-woods together with *Y. sylvellus* Linn. its rather more common, close relative. The distinction is that in *Y. alpellus* the dark streaks from the dorsum reach only halfway across the wing; while in *Y. sylvellus* they reach, or nearly reach, the costa.

The early autumn is the right time for collecting the cases of many of the Coleophorids. I dealt with some of the seed-feeding species in the issue for August last year (*Bull. amat. Ent. Soc.*, **25:** 80-1): this time I propose to write about some of the leaf-feeders, or leaf-miners, I might have said, for the majority use the case as a mobile base from which to excavate the parenchyma of the leaf, leaving the cuticle intact except for the round entrance hole where the case was affixed. Feeding in this manner, each larva makes a series of blotches which reveal its presence. The larvae in the pistol-shaped cases of the *albidella* group feed differently and are consequently much harder to find. I have kept larvae of *C. albidella* H.S., *C. anatipennella* Huebn., *C. ardeaepennella* Scott and *C. ibipennella* Zell. in sleeves and noted that they nibble the tender young leaves from the edge, making no blotches.

But to return to the autumn-feeders: the most catholic in its taste of food-plant is *C. hornigi* Toll.; this is the *paripennella* Zell., of Meyrick (1928) and Ford (1949) and the *albicornuella* Bradley of Heslop's (1964) list: one hopes that at last it has found itself a name that will stick. In some years, as in 1967, it is very plentiful; last October at Benfleet in Essex I found it feeding on Sloe (*Prunus spinosa* Linn.), Rose



Anagasta (*Ephestia*) *kuehniella* Zell.



Ypsolophus (*Cerostoma*) *alpellus* Schiff.

(*Rosa* sp.), Hawthorn (*Crataegus* sp.), Bramble (*Rubus* sp.) and Elm (*Ulmus* sp.), and in Kent on Birch (*Betula* sp.) and Hazel (*Corylus avellana* Linn.). A very similar case is that of *C. potentillae* Staint. and I do not think it is possible to distinguish the two with certainty, but the moths are easily differentiated by the antennae. As far as I know, cases on *Potentilla* spp., *Poterium sanguisorba* Linn. and *Filipendula* (*Spiraea*) *ulmaria* Linn. are always *C. potentillae*, those on Rose or Bramble may be either species and those on the larger trees and bushes are *C. hornigi*: I issue this statement as a challenge and hope that any reader who can do so will offer correction or amplification.

A rather local autumnal larva feeding on Hazel is *C. fuscocuprella* H.-S., whose quaint, hunch-backed

case is attached to the underside of the leaves. The larva feeds within only short range of its case and moves often; consequently its whereabouts is betrayed by leaves pock-marked with a series of small blotches. It usually feeds low down, near the tips of the branches.

Two species feeding on Birch at this time of year are *C. orbitella* Zell. (*wilkinsoni* Scott) and *C. milvipennis* Zell. The latter is omitted by Meyrick and Ford, the former impugning the determination of the single specimen of which he had knowledge. The moth may occur in many collections, for it has been confused with *C. limosipennella* Dup. and *C. badiipennella* Dup. All three have bi-valved cases attached to the underside of leaves, but whereas in the last two the orifice is parallel to the axis of the case, causing it to sit along the leaf, in *C. milvipennis* the orifice is at an angle and the case stands out at about thirty degrees. Moreover the case is longer and more slender than those of the other two species. *C. limosipennella* generally feeds on Elm and *C. badiipennella*, which feeds again in the spring, on Elm and Sloe; but *C. milvipennis*, as far as I know, is confined to Birch. It is widely distributed, at any rate in the south of England, and in some years not uncommon.

I have taken *C. limosipennela* by locating the young bushy Elms where the larvae have been feeding during the late summer and then searching for the cases on the lower twigs in mid-winter. One year I decided to let them over-winter *in situ*, tying a snippet of red string around the twigs which bore cases. When I returned for them in the spring, there was a family of gypsies squatting beneath my bush. They are frequent visitors to the neighbourhood and are the most friendly and courteous people, but I could not bring myself to intrude upon their encampment to collect my larvae.

This occurred before I had discovered how to keep my Coleophorids through the winter. Those species which are full-fed in the autumn hibernate attached to twigs; then in the spring they wander about and do not pupate until about three weeks before emergence. I now sleeve mine out on their respective food-plants, using ladies' nylons. I do this with the consent of the Forester in a wood owned by the Forestry Commission, for which I hold a permit, and I recommend others to make a similar arrangement. At about the New Year, I snip the sleeves off, bring them home and tie them up in the garden in a spot where they get the early morning and evening sunshine. There I leave them until mid-May, that is, about a fortnight before the moths are likely to start emerging. Using this method I have achieved a high degree of success for a minimum of effort.

A. M. Emmet (1379).

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Hymenoptera Aculeata

As I write these notes the 1968 season has proved a slow starter and it is difficult to look forward to August. However, in the hope that some of you have set up some trap nests following my May Collecting Notes, I would like to return to that subject and fill in a few more details particularly as regards the observations that should be made on any nests collected.

Trap nests, whether they be bored out lengths of wood or natural stems, should be put out in bundles. Before they are put out each stem must be

marked so that it can be identified. This is best done by giving each bundle a letter, and each stem within a bundle a number. A greater number of bundles than 26 can be catered for by either the use of double letters or separate colours for bundles put out in different localities. The allocation of numbers to the individual stems within a bundle can be done by cutting the appropriate number of notches at one end.

Now the trap nests are ready for putting out in the field. Place them in sites where small Aculeates are known to be active, some low down, others higher up. They can be hung from the branches of trees, in bushes, under the eaves of sheds, some with their open ends exposed to the sun, others in the shade. The placement of each bundle should be carefully recorded in a field notebook. Essential points are: bundle code number; type and number of individual trap nests; exact locality (with 4-figure map reference); notes on habitat; site of placement and whether exposed to the sun or in the shade; date on which bundle put out; date on which bundle taken in. These two dates give the period during which any nest must have been made. However if the nests are watched from time to time, particularly during periods of fine weather, the inmates may be seen at work. This allows the date of nesting to be established more exactly, and also allows important details of behaviour to be studied and duly noted down against the correct stem number in the field notebook.

When activity has ceased in the autumn the nests can be collected and opened for study. The following are the sort of things to look for: was the hole excavated by the parent in its entirety? If a preformed hole was used, was it enlarged by the occupant? The nest will consist of cells separated by partitions. The innermost cell in the first cell. Does this cell start at the bottom of the cavity? Is the bottom lined with partition material? Are the cells separated by one partition or by two with an empty, intercallary, cell in between? Is there an empty, vestibular, cell above the last cell? Is the cavity closed by a plug? What material is used for the partitions? Is the cavity lined with any material? What is the diameter of the cavity and the length of each cell?

So much for the construction of the nest, now what about the contents of each cell? As the nests have been collected late in the autumn, each cell will usually contain a full-grown larva or even a pupa. With bees there will be little sign of the bee bread that was their food, though with wasps some remains of the prey should be seen. If the prey is to be studied in greater detail the nests should be collected much earlier, as soon as they have been stocked in fact. They must then be handled carefully or the larvae will die of dessication. The nest should either be re-closed carefully after examination, or the contents of each cell transferred to small, cellulose ampules obtainable from pharmacists. This allows of frequent observation with the minimum of disturbance to the occupant and little danger of dessication. If the cell contents are transferred in this way, then a third code, for the cell number, must be added to the codes for bundle and stem number.

For anyone who proceeds this far in the business of trap nesting, a wealth of interesting details can be studied. The nests of the various groups can be as distinct as are their makers. Eumenine wasps lay an egg in a cell before they start to stock it with prey, Sphecids bring in the prey first. Bees of the genus *Prosopis* line their burrows with a salivary secretion which looks like rice paper. Leaf

cutter bees, *Megachile* spp., line their burrows with leaves, while *Anthidium manicatum* Linn. uses a cottony material obtained by chewing at the stems of plants.

I hope my readers are enjoying a good season, and also that some of you have tasted the joys that can be engendered by trap nesting.

25.4.68. J. C. Felton (3740).

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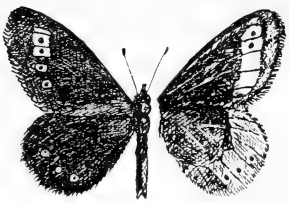
EREBIA EPIPHRON Knoch. A NEW ABERRATION OF THE SCOTTISH RACE

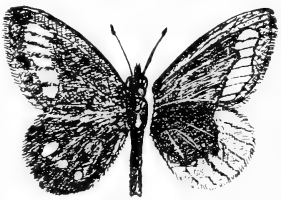
In the Autumn of 1965 while in Edinburgh, I visited Mr D. S. Fletcher, a member with whom I had corresponded. He showed me a short series of *Erebia epiphron* Knoch, which he had taken that year in Perthshire. Amongst these were two unusual specimens—resembling the Central European species *Erebia pharte* Huebn. They appeared devoid of any black eye spots in the orange areas of the upperside and underside and the small orange markings on the underside of the lower wings were also absent. I mentioned these specimens to George Thomson and he very kindly sent me a short series of specimens from the same Perthshire locality and one of these was of this unusual form. It was a male, as were the specimens shown me by Fletcher, so I am not aware whether the form also occurs in the female. Normally the pupils of the eye spots in the female are much better defined than in the male so one would not expect an obsolete form in the female.

The description of the specimen tallies with that of Fletcher's specimens:—

Upperside: Forewings have a blackish brown ground colouring which is traversed by an orange/fulvous band.



Erebia epiphron Knoch. Male ab. *thomsoni*, underside on right.



Erebia epiphron Knoch. Male typical form, underside on right.

The band is without any eye spots and is marked only by dark scaling which follows the line of the nervures running across it. Hindwings are also blackish brown and have three small orange/fulvous spots which are again without black eyes. These spots are small and irregular in size.

Underside: Forewings have the basal area dark brown, transverse band bright fulvous with no eye spots—area between the band and costa is a paler brown than the wing base. Hindwings again have the basal area dark brown and this area ends irregularly with the area beyond it to the costa being a much paler brown—there are no orange markings or eye spots.

The first task was to find out whether this form has been described previously and I can find no such record. B.C.S. Warren's Monograph on the Genus *Erebia* names the race

Erebia epiphron Knoch, from Mid-Perthshire c.2,000 feet. (Described by George Thomson).

1.	male	up. fw.	six orange spots, suffuse, with one black spot.
		hw.	three orange spots, distinct no black spots.
		un. fw.	orange band, two black spots.
		hw.	no marking.
2.	male	up. fw.	short orange band at apex (equivalent length of three spots) and one distinct orange spot. Three black spots.
		hw.	four distinct orange spots, three black spots.
		un. fw.	band of orange broken in middle, three black spots.
		hw.	one minute orange spot, one black spot.
3.	male	up. fw.	six orange spots, suffuse, with five black spots.
		hw.	four orange spots, three black spots.
		un. fw.	orange band, four black spots.
		hw.	four orange spots, one black spot.
4.	male	up. fw.	six orange spots, diffuse and faint, two black spots.
		hw.	three orange spots, three black spots.
		un. fw.	band of orange, two black spots.
		hw.	three very faint orange spots, two black spots.
5.	female	up. fw.	orange band, four black spots.
		hw.	three orange spots, three black spots.
		un. fw.	seven elongated orange spots, four black spots.
		hw.	three orange spots, three black spots.
6.	male	up. fw.	six suffuse orange spots, two very faint black spots.
		hw.	three orange spots, no black spots.
		un. fw.	six orange spots, no black spots.
		hw.	no marks.
7.	male	up. fw.	six orange spots, three black spots.
		hw.	three orange spots, two black spots.
		un. fw.	orange band with three black spots.
		hw.	no marks.

in these Islands as *Erebia epiphron* ssp. *mnemon* Haw. and its localities as 'Westmorland, Cumberland and Scotland'. It belongs to the 'northern' strain i.e. races which, like the typical *epiphron* of the Hartz Mountains, develop four equally strong black spots on the forewings and have distinct, although small, black spots on the underside of the hindwings, sharply outlined with rusty rings. The 'southern' strain however, connected with the ssp. *aetherius* Esp., has the black spots on the forewings normally only two or three in number of irregular size and the underside of the hindwings almost or entirely without any spots. This description of the 'aetherius' strain is much nearer to the mid-Perthshire specimens but still does not cover them completely. However the ssp. *aetherius* has a form named by Boisduval as *nelamus* Bdv. Its distribution is at high level in the Alps (6,000 ft. upwards) and it is described as a smaller form with a loss of markings in both upper and underside. The orange band on the forewings is often reduced to orange spots or is blurred or faint and the black spots reduced to tiny points. The hind wings are without markings either on the upper or underside. Warren comments that the orange band on the forewings is most variable and, while some specimens exist with traces of five spots, others are completely unmarked. He then refers to the three Irish specimens (Croag Patrick) in the National Museum at Dublin and he considers that these are referable to the form *nelamus*.

In Ford's book 'Butterflies', he refers to the Scottish race of *E. epiphron*, which Cooke had named *scotica* Cooke as differing slightly from ssp. *mnemon* of the Lake District, as being certainly only a form of *mnemon*. The insects he

refers to are from the Rannoch area. It is possible that the race in mid-Perthshire is a separate race and if the name *scotica* Cooke must be reserved for the Rannoch race then those in mid-Perthshire may require naming. It is possible that Cooke did intend his name for the mid-Perthshire race and I would consider it to be a form of *aetherius*. While all my Westmorland specimens tally with Haworth's description of ssp. *mnemon* (the northern strain of *epiphron*), all the specimens of the mid-Perthshire race would fit better into the descriptions of the southern strain 'aetherius'. A very much longer series of the race is needed to make a full study but I would provisionally place this race not with *mnemon* but with *aetherius* form *nelamus* i.e. the high alpine form. One of the specimens sent me by Thomson is almost identical with one taken on the Simplon this summer by myself. This would tie in with other recent observations on some of the Scottish butterflies which have placed *Aricia agestis artaxerxes* Fab. with *Aricia allous* G.H., a mountain species of the Continent and Thomson has suggested in this *Bulletin* that the uni-voltine race of *Pieris napi* Linn. occurring in the Scottish mountains may be *Pieris bryoniae* Ochs.

I would place the newly described aberration with *E. epiphron aetherius* form *nelamus* but as Fletcher points out—the description of *nelamus* states that the band becomes fainter and more broken up as the spotting is reduced while the converse appears to be true of the Perthshire specimens described, the reduction of the spots to complete absence seems to make the band more distinct and bright. As the aberration appears to occur quite regularly within the locality it merits a name and in view of the work being done by George Thomson on the Scottish Lepidoptera an appropriate name would be *Erebia epiphron* Knoch ab. nova *thomscni* Cribb. The type is in my collection labelled 'Mid-Perthshire 1967. G. Thomson. 2,000 ft.' and is a male.

George Thomson has kindly described a short series of specimens which he took this year in the same locality and this is set out opposite.

1.12.67. P. W. Cribb (2270).

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MIGRATORY LEPIDOPTERA IN SOUTH AFRICA, 1965-6

K. M. Pennington (1967), in his presidential address to the Entomological Society of Southern Africa, refers to the great migratory flight of *Catopsilia florella* Fab., during the late summer and autumn of 1966. Quickelberge (1967) also mentions it.

The following notes are the result of my personal observations on this particular migratory flight, as well as on other migrant Lepidoptera during the summer of 1965-66. These observations were carried out mainly at Hilton, Natal (3,702 feet), some thirty-five miles east of Balgowan where Mr Pennington resides.

Towards the end of October 1965 a thin—density III—(Williams, 1958) flight of *Glycesthia aurota* Fab., was noted, while another Pierid, *G. creona* Cram., was also involved. Both species were in fresh to worn condition. This flight continued intermittently, in the same density, until November 3rd. The sky was overcast for most of the time and the flight took place only during sunny intervals. It was not noted again until December 8th when it was resumed for that day only and in a very thin density. The flight was then in a S.E. direction, whereas previously it had

been N.E. or E., which is more usual. Activity would commence about 9 a.m., and might continue until late in the afternoon, depending upon the weather conditions prevailing. When the sky became overcast all butterfly activity ceased immediately. The migrating Pierids often paused to feed at flowers. Another species which was prevalent at the time was *Colias electo* Linn., sometimes it appeared to be flying with the migrants, and sometimes in the opposite direction.

Nothing further of migratory flights by butterflies was observed, at Hilton, until the great flight of *Catopsilia florella* was first recorded there on 27th March 1966. Pennington (1967) remarks that this great movement of *C. florella* stretched across the subcontinent from west of Pretoria, on a four hundred mile front, to the Indian ocean, and reaching Rhodesia and Mozambique. It was also recorded in the Orange Free State and in the Eastern Cape Province. In the latter it was first noted a few days earlier than in Natal.

Quickelberge (1967), writing in East London, Cape Province, remarks that it moved N.E., or roughly in line with the coast, appearing later further north and eastwards. The direction was usually N.E., but sometimes E. or N.W.

At Hilton, the flight reached its peak at the end of March or very early in April, and at that stage the density was at least V (thick). There was also considerable movement by *G. aurota* at the same time, but this species was far outnumbered by *C. florella*. The great flight of the latter butterfly was remarked upon throughout the country by the Press and the public in general, and there were many of the usual and typical scare reports of 'Army Worm'. The latter is the larva of a species of the Noctuidae, *Laphygma exempta* Walk., and invariably when such a butterfly migration takes place, the public react in the same way. The flight at Hilton continued into the second half of April, but by the 15th of that month it had become thin. It was still noticeable in East London on April 7th (A.C.v.B.see last paragraph), in Durban butterflies were abundant on April 8th, but were not so numerous as a few days earlier. They were there seen heading out to sea in a N.E. direction, across the bay.

The *C. florella* at Hilton were in fresh condition, while the abdomens of the females were flaccid and did not contain eggs. The condition of *G. aurota* varied from fresh to worn, and some were seen mating. *C. florella* showed no interest in sex. Both species paused momentarily to feed at flowers, a hedge of *Abela* sp., in blossom at the time, being very popular. Late in the afternoon *G. aurota* could be found roosting on grasses and low-growing plants and also on trees, up to a height of ten feet. The roosting butterflies often occurred in loose groups or clusters, as many as twenty having been counted in one square yard. Although *C. florella* was sometimes seen resting on grasses momentarily during the day, its roosting quarters were not located despite constant search. Other species occasionally noted taking part in the flight were *Danaus chrysippus* Linn., *Papilio demodocus* Esp., and *Terias* sp. Dragonflies were also reported as participating, in Pietermaritzburg. (A. C. v. B.).

Although *Vanessa cardui* Linn., was invariably present, it was not observed taking part in any directional flight and was merely flitting about in its normal manner.

Towards the end of April the writer visited the north-eastern Transvaal and the Kruger National Park. *C. florella* and other migratory butterflies were abundant everywhere; and while there was still some evidence of migration taking place, directional flights were becom-

ng very thin, if they were not petering out altogether. Migratory pecies of moths were particularly plentiful at Potgietersrus, N.E. Transvaal, where there was an unusually large concentration of *Rhodometra acraria* Linn., at lucerne flowers (*Medicago* sp.); *Utetheisa pulchella* Linn., was also particularly plentiful and *Heliothis armigera* Huebn., was much in evidence. All these, as well as other migratory species such as *Nomophila noctuella* Schiff., were frequent at light during the summer of 1965-6.

The migration of *Catopsilia florella* in 1966 surpassed all known records in southern Africa (Pennington, 1967). The causes of such migratory flights remain unknown; but it is believed that they are influenced by rainfall. Shortage of food, owing to an overpopulation of larvae, may, of course, be a more immediate cause.

My thanks are due to Dr. A. C. van Bruggen for kindly permitting the use of his observations. Where these have been quoted they have been followed by his initials in parentheses.

J. S. Taylor (4176).

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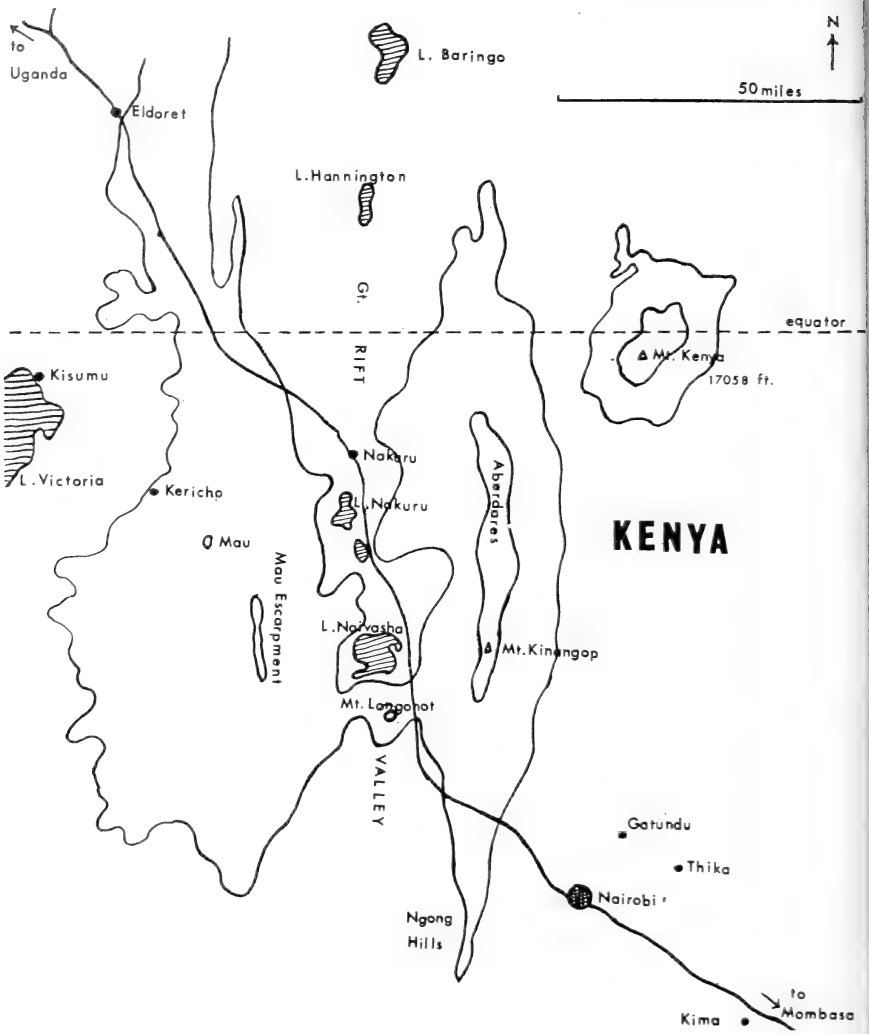
ABNORMALLY LARGE POPULATIONS OF LEPIDOPTERA IN EAST AFRICA. 1965-1966

Large populations of insect pests are not uncommon in tropical areas. During a three year contract in East Africa as an agricultural entomologist I was lucky enough in being present during the 1965-66 season when extremely large populations of Lepidoptera occurred.

The noctuid *Spodoptera exempta*, Wlk. commonly referred to as the African Army Worm, has long been known to occur in large numbers causing devastation to gramineous agricultural crops especially maize. During the early months of 1966 this species occurred in phenomenal numbers. Light traps were taking as many as 20,000 moths in a night and fantastic counts of pupae per square yard of soil were made in some areas. The caterpillars defoliate almost every member of the grass family and they migrate *en mass* when local food supplies are exhausted. Farms which lie in the path of the caterpillars or where large numbers of eggs are laid, would lose their entire crop unless insecticide sprays were applied. When Army Worm occurs, it is a major topic of conversation in Nairobi, especially when accidents are caused by cars skidding on crushed caterpillars or wheels of locomotives do not grip the rails because they are too slippery with the juices of crushed caterpillars. Citizens of Nairobi really become agitated when the caterpillars reach the golf courses, bowling greens and grass tennis courts!

For many years many farmers in Kenya believed that the adult of an army worm was the African Common White, *Anaphaesis mesentina* Cramer. This belief evolved because this butterfly also appeared on migratory flights at the time of large outbreaks of army worms. When I was working on an estate at Kima, some 60 miles from Nairobi along the Mombasa Road, during January 1966, I observed millions of these butterflies migrating in a south easterly direction. The air was thick with them as far as the eye could see for an approximate twenty miles stretch of the road on five consecutive days. I would not like to hazard a guess at the numbers



involved. Many were very small stunted specimens.

My research work in East Africa involved experiments in controlling Army Worm. Suitable areas for such experiments were sometimes difficult to obtain, so when I received a telephone call from the headmaster of Kilimani Primary School, Nairobi, offering the use of the school football field, my colleague and I were only too pleased to take advantage of the offer. I was very surprised to find, as well as the millions of Army Worm many hundreds of fully grown larvae of the Yellow Pansy, *Precis eonone* Linn. *f. cebrene* Trim. feeding on a weed which grew amongst the grass.

Heliothis armigera Huebner the American Bollworm, although normally a pest of cotton, occurred in such large numbers that they were

attempting to eat everything that came their way. African smallholders in the Kikuyu area found their potatoes, peas and beans completely defoliated. I even found some larvae attempting to eat banana leaves. A further build up occurred in the Mt. Kenya farming area later in 1966. The larvae here attacked the green "milky" stage of wheat, eating into the unripe ears.

A Saturniid *Imbrasia epimethia* can usually be found feeding on foliage of the Black Wattle tree *Acacia mearnsii* where plantations occur. These trees are grown for their bark which is used in the tanning process. African smallholders also grow these trees for making charcoal. During the early months of 1966 these larvae occurred in very large numbers. Trees in the Gatundu area, some twenty miles north of Nairobi, were defoliated by the 6" spiny caterpillars. I recall sitting quietly under some trees and being able to hear the caterpillars munching the foliage and the noise of their frass falling to the ground.

One of my favourite collecting grounds for the African Clouded Yellow *Colias electo* Linn. were some lucerne fields bordering the north shores of Lake Naivasha. This lake is one of several volcanic lakes of the Great Rift Valley. The area is typical of Kenya in that the scenery is extremely beautiful. Looking across the lake one can see the volcano Mt. Longonot directly opposite, and to the east lies Mt. Kinangop and the Aberdares. The hills of the Gt. Rift Valley Escarpment are visible in the distance. A few hundred yards out into the lake floats a mass of papyrus in which Hippopotami remain during the daytime. The strip of water bordering the shore is thick with patches of water lilies and thousands of water birds. Pelicans swim in groups of a dozen or more, while fish eagles fly up and down, their phantom-like cries echoing from the hills. The sun beats down unrelentingly. The area has only one disadvantage. Along the edges of the lake mosquitoes swarm in profusion and I can assure everyone that they bite throughout the day as well as in the evenings.

The East African race of *Colias electo* Linn. *pseudohecate* Berger are always in plentiful numbers here. One could rarely make a sweep with a net above the lucerne without catching at least one butterfly. During the 1965-6 season the lucerne was literally crawling with caterpillars and many of these butterflies migrated in a south easterly direction later in the season.

The female of the African Clouded Yellow exhibits a range of colour forms as does the British species. The colours range from white through cream, buff, and pale yellow to orange. When butterflies of the same species occur in large numbers it is surprising how quickly one learns to recognise individuals which have slight differences in pigmentation, without really having had a good look at them. On several occasions I have chased a particular specimen across a field, ignoring scores of others without really knowing why, and on catching it I have found it to be an interesting variety. Perhaps it is because of acute colour perception or it may be a result of a slight difference in the flight of the insect.

During this season, another butterfly was also present in large numbers in the lucerne fields. The Painted Lady *Vanessa cardui* Linn. breeding up in vast numbers before migrating northward to Europe. The larvae were feeding on the weed *Malva verticillata* Linn. (Mallow) which was growing amongst the lucerne, along the edges of the fields and in the uncultivated areas where spray was carried by the wind from the irrigation pipes. I collected many of these larvae and raised them in cages at my

home near Nairobi. Examination of approximately one hundred adults which later emerged, failed to reveal any variations.

The infrequent occurrence of such abnormally large numbers of certain species of Lepidoptera raises the question of the cause of these increases. At the time of observing the above example I thought that it was probably the result of optimum conditions for Lepidoptera in general and, although I noted the fact that many of the above mentioned species are known migrants, I believed that they migrated away from East Africa and did not consider that they may also migrate into East Africa.

Recent work by Brown and Swain (1965) working on the African Armyworm has shown that there is a northerly origin for these moths. In Kenya and N. Tanganyika the season for Armyworm is from November to May. During May to October no trace can be found of any stage of this species. Evidence from light traps in Ethiopia, Somalia and Aden shows that moths occur in these areas in May and to October.

Data is available from twenty light traps throughout East Africa. In the 1965-6 season the first arrival of moths in Kenya was in November. Examination of weather conditions at the time show that their arrival coincided with the southern limit of the advancing north-easterly winds.

It must be assumed that large numbers will breed up when conditions are optimum. When this happens in the northern areas, more moths will reach East Africa. If conditions are optimum here also, fantastic numbers result, an example of which is described here. This pattern of build up of numbers is probably as true for *Vanessa cardui*, *Anaphais mesentina* and *Colias electo* as it is for *Spodoptera exempta*.

L. McLeod (3534).

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BREEDING FOR THE REINFORCEMENT OF SPECIES

In his articles condemning the practice of breeding insects for the reinforcement of species, Mr Goddard (*Bull. amat. Ent. Soc.*, **25**: 126; **26**: 114-6) lays considerable emphasis on the term "well-adapted species". I think that it will be useful to consider the implications of this term and its relevance to the future survival of certain of our, now localised, species. The impression given in these articles is that once an insect is well-adapted, it will remain this way in the future and therefore must be protected. One vital fact is overlooked, this is that the environment is undergoing continual changes and therefore the present well-adapted nature of a species has only a transient value. It would be true to say that today's well-adapted insect could be tomorrow's failure. As Mr Goddard points out, the well-adapted individual occurs as the result of that individual possessing advantageous characteristics. In a changing environment these characters will not always be advantageous, in fact a time could come when they would be disadvantageous. Therefore it is always important when discussing advantageous and disadvantageous characters to remember that these terms can only be applied to a certain point in time.

Now, it is generally believed that adaptation to changed environments takes place by natural selection and it must be understood that selection can only act upon the genetic material

i.e. the characters) that is present in he population. Therefore any popu- ation with a large variety of charac- ers present in its gene pool will be n an advantageous position to face uture change. This is because, the greater the variability then the better will be the chance of selection producing an individual suited to the new environment.

Such a large variety of characters is normally maintained in the popu- ation as a result of outbreeding. Out- breeding leads to a high level of heterozygosity in the population. Therefore the, at present, disadvan- ageous (recessive) characters can exist in the population in such a way hat they are masked by the presence of other, at present, advantageous dominant) characters. Thus the dis- dvantageous characters will not be ully expressed. In this way there is a eservoir of characters maintained in he population, any one of which may be advantageous in the future as the esult of an environmental change.

Bearing this in mind, we must now examine the position in our present leclining populations of insects. The arious causes of decline all have one esult in common. This is that they solate and reduce in size the habitat of the species under consideration. The immediate result will be that here will be fewer individuals in the breeding population. Also, the maller area of the habitat will mean hat those individuals present will ace, in all probability, a greater niformity of habitat than previously i.e. there will be fewer microhabi- ats). The smaller numbers will lead o a higher level of inbreeding in the opulation. The uniformity of the abitat will mean that there will be election for a much more specific set of characters. These two factors will esult in a high level of homozygosity n the population together with the oss of the majority of the characters hat are not immediately advantage- ous. This will lead to a highly special- ised and well adapted population of insects. Such a population, facing a changing environment, will have no diversity in its gene pool on which selection can act, and will face extinction.

If we wish to combat the problem of long term survival it appears to me that one way would be to ensure that individuals in the now disjunct colon- ies were once again brought together as they were when the population was contiguous. This might lead to the re-establishment of the previously existing gene flow. Insects from one locality could be bred and then released into another locality. Breed- ing in captivity would have the effect of maintaining some characters that would otherwise be lost and it is of course this *variation* that we should be trying to protect, not a number of small populations of highly specialised insects. This is where the true conser- vationist must differ from the "pre- servationist" who is merely inter- ested in maintaining the *status quo*. Now I am aware that the factors involved in the survival of insect populations are complex and concer- ned with more than theoretical genetics. Nevertheless, I believe that the argument I have presented should be borne in mind when considering the future survival of our insects.

I should now like to comment on a point from Mr. Goddard's second article. In this he says that, "a human lifetime is peanuts in evolutionary terms". This statement is used to dismiss the possibility of experiments into the effects of reinforcement of species. Whilst I would agree that a human lifetime is peanuts in terms of the evolution of the human species surely it is wrong to suggest that all evolution proceeds at the same rate as human evolution. The rate of evolution of an organism will be determined partly by the generation time of the organism and partly by

the nature of the selective pressures involved. Therefore an insect species with one or two generations a year will tend to show a more rapid response to environmental changes than ourselves. Consequently it is quite feasible to carry out experiments on the effects of reinforcing populations. Such experiments could be carried out by releasing specimens with genetic markers into the population, the progress of these markers in the population could then be followed. Any experiment of this kind will of course take some time, but this is no reason for dismissing such experiments. Indeed there is all the more reason to start immediately. Maybe the new Amateur Conservation Group will look into this problem especially as controversy about this appears to have helped in the formation of the group.

Finally, I hope that this note has been of some use to those members (myself included) who derive considerable pleasure from releasing butterflies and who may have been disturbed by the adverse comment this practice has received in recent numbers of the *Bulletin*. The argument about releasing butterflies is a perennial one and the passions it arouses are rather more emotional than scientific. Perhaps the only comment it is possible to make is that, as yet, *no* experimental evidence has been offered for or against the argument. Until such evidence is forthcoming I hope that we will all keep an open mind on the subject.

10.3.68. J. Muggleton (3253).

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REARING STICK INSECTS

I read the recent articles on these insects with great interest. The two species that I am breeding, at the moment, are the Corsican (*Clonopsis gallica* Charp.) and the Madagascar (*Sipyloidea sipylus* Brunn.). May I make a special plea to all actual and potential breeders, not only of Stick Insects, to estimate the amount of space needed for the insects to move about freely, then double it? I have seen a number of so called rearing cages, horrible cylindrical, plastic prisons, with the unfortunate inmates huddled like roosting fruit bats. I make my cages myself with a carcase comprising two rectangles, top and bottom and the four corner uprights. The back and two sides are boarded in with either hardboard (rough side inwards) or strawboard (Essex board). A fair sized rectangle is cut out of both the top and the bottom of both sides and a piece of muslin or fine nylon net fastened across. This is preferable to perforated zinc as one can spray water mist through the net and ensure that nearly all of it passes through into the interior. The double ventilation ensures adequate circulation. The top is fitted with a single sheet of glass. This is ideal for removing and replacing foodstuffs. The front also has a single sheet of glass held by clips.

My smallest box measures at least 18″ across and a similar height. The distance from back to front can be considerably smaller. A useful readymade cage can be made from a discarded apiarist's demonstration hive with the interior removed and the ventilation altered. They are already fitted with glass back and front.

With sizeable cages a complete spray of bramble up to 3ft long can be accommodated, rearing up to the top of the cage, curving down one side and across to the other side. This means that the insects have natural footholds all round their quarters. I manage to keep the leaves fresh for at least a fortnight by a method of cutting the stems. I have found that it is essential for the cut end of the stem to be exposed to the air for the

minimum time. To accomplish this, I lick the exposed cut the second I have severed the stem. There is always a few seconds delay while one pushes the prickly, leaf-catching stem into a jar which already contains other cut stems. The cages should be protected from the full glare of the sun since, apart from discomfort to the occupants who lack the compensation of a cooling breeze, the water loss from the stems can be quite considerable, a jam jar being half emptied in a day.

Most of the catalogues mentioning the Madagascan Stick Insect (*S. sipylus* Bunn.) refer to its habit of sticking their eggs to twigs etc. I have found this to be less common than that of simply allowing them to fall to the ground. I cover the bottom of the cages with a layer at least ½″ thick of fine, round, washed sand.

The separation of sand, frass, round and oval eggs is relatively simple, if time consuming. The sand is carefully scooped out with a flat piece of tinplate and replaced with a new clean layer. The mixture of sand and eggs is then passed through a household metal-mesh sieve. All the sand and a little frass passes through. I then place the remaining mixture, a little at a time, on to a long rectangle of smooth cardboard, about 8″ by 18″. By using a rotating action and gentle tilting, the *Clonopsis gallica* eggs are rolled off the edge like miniature marbles, into a waiting receptacle. The remaining mixture is now returned to the original sieve and shaken with more vigour than before. Most of the frass passes through and the remaining *S. sipylus* eggs can be removed with a camel hair brush. The adhesive side of these eggs usually has sand grains adhering which catch on the brush hairs.

Some handling of the insects is almost essential, especially when replacing foodstuff. I remove the old stems with occupants in situ and stand these in a block of wood with holes bored in a row. The new stems are then placed in. To remove *C. gallica*, I find that the best way, with those that do not naturally walk off, is to jostle them by placing the fingers in a ring round them, without actually squeezing or pressing. They arch their backs and raise all their legs, in a manner reminiscent of the fore legs of a praying mantis. By suddenly blowing on them at this stage they fall onto the waiting foliage beneath, finding a miraculous claw hold before they reach the sand. This method should not be tried with fully adult specimens, full of eggs, as they almost certainly hit the bottom of the cage. They usually start walking when jostled.

As R. Johnson mentioned in the November issue of the Bulletin, (*Bull. Amat. Ent. Soc.*, **26:** 126), *S. sipylus* is a beautiful insect. I must disagree with his statement that the wings are hidden under sheaths. The hind wings, which are the main ones, are not covered by anything. The costal edge of the wing, however, is of practically the same colour as the body, the remaining anal veins bearing the rosy tints. The wings when folded like a fan, have the costal edge on top. The forewings are reduced to small flaps. These insects appear to dislike handling much more than *C. gallica* and either make off at a fast pace, drop like a stone or freeze into a thin knitting needle, devoid of projections. I dislodge the young ones by simply blowing on them, the adults readily walk on to ones waiting hand. When handled at all, they exude a penetrating odour which is transferred to one's hands, rather musty but not unpleasant. The insides of my cages are painted with matt ochre emulsion paint, rather similar in colour to *S. sipylus*. I find that nearly all members of this species, young and old alike, rest gregariously together during the day, side by side on the painted surface in their typical

knitting needle posture. *C. gallica* on the other hand, prefers the foliage, standing like a well trained pointer at the kill.

I, too, have experienced the emerging insect with its tarsi tangled in the egg shell. I believe that this is due to too dry an atmosphere around the eggs. To avoid this, I placed the eggs on a filter paper in a petri glass, with the lid slightly displaced. Every morning I lightly sprayed the inside of the lid with water. To remove an adhering shell however, I found that one could be successful by first gently crushing the shell and removing the pieces with a pair of fine, watchmaker's tweezers. The insect can be prevented from walking away by placing an upright pin in one of the loops caused by legs and shell. When the shell is removed a white membranous bag will be revealed. This, I well wetted with saliva. If after two minutes or so, the insect has not already released itself, gentle pressure under the 'armpits' will accomplish this. The pressure must be very gentle indeed, and small movements made under each leg in turn as one should tighten a cylinder head, for instance. The geometry of the insect body being what it is, one cannot remove one leg completely while the others are still trapped, without doing physical harm to the creature. The egg bag can be tethered, meanwhile, with another pin. Usually, however, it is better to destroy the insect, especially if it has been trapped for some time. The femora and tibiae are often grossly disformed.

Under such ideal conditions, the population rapidly increases. When mine reached 300 or so and I had exhausted my supply of school children and teachers as recipients, I found it necessary to cull the herd. The easiest and quickest way is to hold a twig full over a pan of boiling water. The steam causes them to release their hold immediately and death from protein coagulation appears to be instantaneous. If any reader would like some specimens, please send a syrup tin with perforated lid and return postage, for young specimens and a larger container for adults. *S. sipylus*, remember, is getting on for 6" long. The tin should in turn, be placed inside a cardboard box and packed with something light and resilient. I cannot, in all conscience, submit my charges to the gross machinery of the Post Office without taking whatever precautions are possible.

My address change was received, by the Society, too late for inclusion in the 1966 supplement and is as follows: "Westland," Westfields, Kirkbymoorside, YORK.

Donald H. Smith (2864).

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WATER BEETLES IN A CHESHIRE POND

The pond concerned is a rich detritus pond on grazing land, but pretty high for round here, being just under 500 ft. It contains plenty of *Elodea canadensis* Michx., *Lemna trisulca* Linn., and a species of *Potamogeton*, Water Starwort (*Callitriche* sp.), and Water Crowfoot (*Ranunculus* sp.). I have worked it every year from 1961 to 1967 inclusive, but *Juncus* sp. and *Carex* sp. have been steadily encroaching, and in 1967 hardly any water remained which was reachable from the bank. I am sorry, because both its interest and delightful situation made it my favourite pond.

As a sort of obituary notice I decided to make a list of all the beetles taken there, and having done

Table 1. Hydradephaga.

	1961	1962	1963	1964	1965	1966
Acilius sulcatus Linn.	30.5 (2)	7.6 (2)		28.2 (1)		
Agabus sturmii Gyll.		7.6 (1)		28.5 (2)		
A. bipustulatus Linn.		7.6 (4)	5.7 (3)			
A. nebulosus For.	1.5 (1)					
Copelatus agilis Fab.		7.6 (1)				
Dytiscus marginalis Linn.	6.6 (1)	7.6 (4)	5.7 (1)	28.5 (1)	4.6 (2)	
D. circumcinctus Ahr.					4.6 (2)	
Haliplidae	6.6 (6)	7.6 (6)	5.7 (x)		4.6 (x)	2.5 (12)
Hydroporus striola Gyll.		7.6 (4)	5.7 (4)	28.5 (2)		
H. dorsalis Fab.		7.6 (x)	5.7 (7)	28.2 (x)	4.6 (x)	2.5 (x)
H. erythrocephalus Linn.		7.6 (5)	5.7 (6)	28.2 (x)		
				28.5 (6)		
H. palustris Linn.		7.6 (7)	5.7 (5)	28.2 (4)	4.6 (5)	2.5 (10)
H. pubescens Gyll.		7.6 (2)			4.6 (6)	2.5 (1)
H. umbrosus Gyll.		7.6 (2)				
Hyphydrus ovatus Linn.		7.6 (3)		28.5 (1)	4.6 (1)	2.5 (2)
Ilybius guttiger Gyll.					4.6 (3)	2.5 (2)
I. subaeneus Eric.				28.5 (1)	4.6 (1)	
Laccophilus hyalinus Deg.		7.6 (1)				
Rantus exsoletus For.		7.6 (3)	5.7 (2)	28.5 (6)	4.6 (x)	
R. pulverosus Steph.		7.6 (1)				

Table 2. Hydrophilidae.	1961	1962	1963	1964	1965	1966
Anacaena Limbata Fab.			5.7 (2)			
A. globulus Payk.		7.6 (5)	5.7 (4)			2.5 (1)
Enochrus affinis Thunb.						2.5 (1)
E. testaceus Fab.						2.5 (3)
Helophorus aquaticus Linn.					4.6 (1)	
Hydrobius fuscipes Linn		7.6 (3)	5.7 (4)	28.2 (1)		2.5 (5)

so, wondered if it would interest other pond hunters. Hence this note for the *Bulletin*.

The tables below give the dates when each species was taken. The figure in brackets gives the number of specimens taken; but "x" means that, having taken eight or more in consecutive collections, I gave up counting.

A 1967 column is omitted. I visited the pond on Oct. 11th., but my only catch was one *Dytiscus marginalis*!

It will be seen that Haliplidae are not particularised. All those taken were of the *Haliplus ruficollis* group, and whenever I took one or two home for identification, as I occasionally did, they always proved to be either *lineolatus* Mann., *immaculatus* Gerh., *wehnckei* Gerh., or *ruficollis* Deg.

D. circumcinctus is regarded as rare, but I have taken a total of nine, from three widely separated districts. Six of these were females, of which only one was sulcate. Conservationists please note that "taken" does not necessarily mean "killed."

I. subaeneus also appears to be considered rare, but although only two were taken from this pond, I have taken it frequently and in many different areas, sometimes in considerable numbers. In fact a piece of gross carelessness on my part once elicited from the late Prof. J. Balfour-Browne, for whose kindness and patience I cannot be too grateful, the remark that this was evidently a common species in Cheshire!

The single specimens of *Copelatus agilis* and *Rantus pulverosus* are the only ones I have ever taken in Cheshire; or, indeed, anywhere else.

18.3.68. Hugh Caiger (2908).

HOME-MADE CABINETS AND SETTING-BOARDS

With so much pressure on the keen entomologist's pocket nowadays, there is every reason for him to extend the do-it-yourself cult to his equipment. His efforts will perhaps not have the professional touch of perfection, but he will have the additional pride of knowing that not only is his fine display of specimens his own creation, but so also is the cabinet or store-box which contains them. Furthermore, such equipment can be made very easily, at precisely the size and capacity one requires and at a fraction of the cost of the commercial models. Mistakes may be made, but one's own are always more acceptable than the defects of bought, second-hand articles.

In my earliest days of collecting Lepidoptera, I used cardboard boxes (shallow Christmas gift boxes bought at 'Woolworths') for my specimens, but the drawbacks of these are obvious. Damp, museum beetles, house moths and Psocids will soon penetrate cardboard if they lurk nearby, and while one may be lucky for two, three or even ten years, it isn't worth risking it. For temporary accommodation, only, will such boxes serve.

If one is faced with the necessity of buying enough store-boxes to take a large collection, a considerable outlay of money has to be made. In 1964, this problem caught up with me, and so I designed a thirty-drawer cabinet, bought the necessary materials, and successfully constructed it. I shall describe the design of one drawer, for the reader may want to adapt my design to suit his own needs. I call it a drawer, but it need not be part of a cabinet. I have subsequently made more, which are loosely-piled, exhibition-case-type store-boxes until I choose to make a cabinet to take them.

One important point needs to be made first. One requires timber, glass and sheet cork cut to specific sizes. Consider the suppliers of these materials, and remember that off-cuts of less than a foot in length are generally useless to them. They discard them, but you pay for them in addition to the cutting charge. Therefore, work out in advance sizes of which the preparation ensures minimal wastage by the suppliers. For example, I chose 15″ x 18″ as my drawer size, reasoning that 12 sheets of ply of this size could be cut from a sheet of 5ft x 6ft without any waste. On another occasion, making some 9″ x 12″ drawers, I discovered that buying pieces of cork ready cut to $8\frac{1}{2}$″ x $11\frac{1}{2}$″ size would in fact cost twopence more per sheet than buying the standard foot square size—more money for less cork. I cut it to size myself (easily done with a scalpel) and used the off-cuts for more drawers and for setting-boards.

Timber requirements are as follows. One piece 15″ x 18″ x $\frac{1}{4}$″ ply for the base of the tray. The depth of the tray is $1\frac{1}{2}$″, so the sides are two pieces of $1\frac{1}{2}$″ x $\frac{1}{2}$″ x 15″ and two of $1\frac{1}{2}$″ x $\frac{1}{2}$″ x 17″. Parana pine or some other hardwood is a good choice, but for the following strips there is no need to specify type of timber, except to mention that hardwood is required. Don't forget that the two $\frac{1}{2}$″ thicknesses of the sides complete the 18″ of the length. Use thin copper hardboard nails to nail base to sides. On top of the tray's *inside* edges are glued four strips of $\frac{1}{4}$″ x $\frac{1}{4}$″ timber, two 17″ and two $14\frac{1}{2}$″ long. The lid is a glass frame (window glass) that lifts off. The glass must be $14\frac{1}{2}$″ x $17\frac{1}{2}$″ glued with 'Evostick' into four grooved strips of timber, two of $\frac{1}{2}$″ x $\frac{1}{2}$″ x 15″ and two $\frac{1}{2}$″ x $\frac{1}{2}$″ x 17″. Below the lid's *outside* edges four $\frac{1}{4}$″ x $\frac{1}{4}$″ strips are glued, two $17\frac{1}{2}$″ and two 15″ long which, when the lid is on, fit over those of the tray

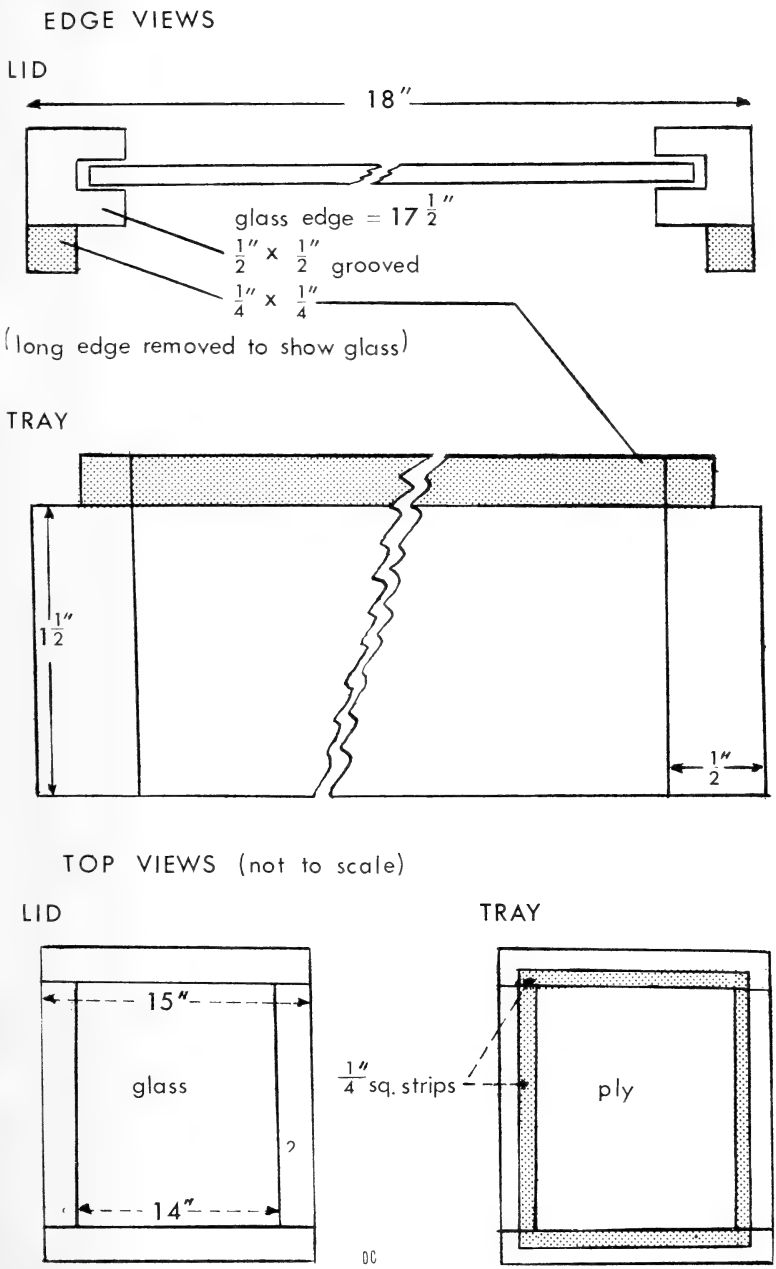

Fig. 1. Plan of a cabinet drawer.

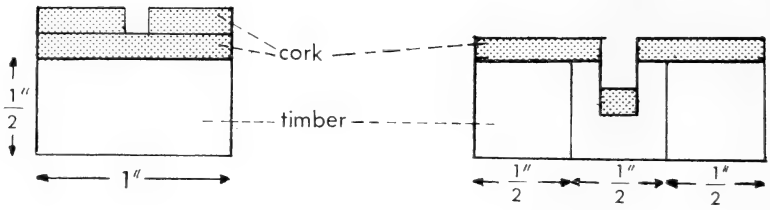

Fig. 2. End views of home-made setting-boards.

ensuring a firm fit and comparatively airtight conditions.

The groove holes in the four corners of the lid, and any other chinks or cracks, are filled with plastic wood. When the construction is completed, the drawer is sand-papered, and varnished inside and outside. I recommend one coat of clear or pale golden varnish followed by two coats of mahogany high gloss wood stain for a very pleasing result. The first coat of clear varnish prevents the wood absorbing the subsequent gloss turning the mahogany glow into a dingy dull brown. The tray is lined with cork and finally papered. Both cork and lining paper must be thoroughly covered with, respectively, 'Evostik' and wallpaper paste, otherwise they will cause considerable trouble by heaving and buckling. When dry and with the glass cleaned, the drawer is ready for use. It costs only about a quarter of the price of the commercial equivalent.

So do home-made setting-boards which I have made in all sizes from 1″ to 8″ wide and usually one foot long. A very simple 1½″ type, costing only about sevenpence, can be made as follows. Buy three strips of ½″ x ½″ x 12″ wood, only one of them grooved. Stick them together, the grooved one in the middle, cover top and groove with off-cut strips of cork, paste lining paper over the lot, and the job is done.

For 'Micros', I use 1″ boards with two layers of cork, the groove formed by a very narrow slit between the pair of upper strips.

I should be most interested to read about other peoples' ideas, designs and creations of do-it-yourself entomological equipment.

28.8.67. B. Wurzell (3718).

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LETTERS TO THE EDITOR

Sir,—I wish to make a plea for restraint in the use of latin names in *Bulletin* articles. I feel that two quite differing appraisals should be made of living things mentioned in an article. On the one hand, specimens are purposely identified either for direct recording as such or for positive identification with an associated creature or plant. On the other hand, some species may be mentioned almost in passing, the finishing touches of colour that transform a

rather monotonous screed into an enjoyable article.

In a different context, there is also the danger that a species that has by no means been positively identified, is pinpointed with a specific name. How often do we see . . . the Red Wood Ant (*Formica rufa* Linn.) Unless one is a myrmecologist, every Wood Ant is *F. rufa*! Yet it could easily be *F. pratensis*, *rufa* var. *rufo pratensis* or even *F. exsecta*.

If one is describing a walk down a quiet country lane and mentions the heady perfume of honeysuckle, surely that is sufficient. I personally, would find it most irritating to read . . . the heady perfume of Honeysuckle (*Lonicera periclymenum* Linn.) . . . but the *Bulletin* abounds in this. I realise that the specimen might just happen to be *L. caprifolium*, but surely, unless the honeysuckle forms a specific part in the ecology of that area which is being reported and has been specifically identified, this is of little import. It is far better to be vague than to be wrong.

Which of the two following excerpts do you prefer, the first or the second?

"We chose a Sessile Oak (*Quercus petraea* Mattuschka) under which to eat our lunch. The flies (*Stomoxys calcitrans* Linn., *Hydrotaea irritans* Fall. *Haematopia pluvialis* Linn. and *Chrysops caecutiens* Linn.) were a nuisance but all irritation vanished when we observed a dusky Silver Washed Fritillary (*Argynnis paphia* var. *valesina*) settle on some Ragwort (*Senecio jacobaea* Linn.) in front of us."

"We chose an oak under which to eat our lunch. The flies were a nuisance but all irritation vanished when we observed a dusky Silver Washed Fritillary (*Argynnis paphia* var. *valesina*) settle on some ragwort in front of us."

I repeat my plea. Can we not all use discretion in the case of latin names? A much neater method would be to group all named specimens together at the end of the article in the form of a specific list. This would surely be of more assistance to readers who wished to make use of identifications. I would hasten to point out that my views are in no way influenced by the fact that I index the *Bulletin*.

D. H. Smith (2864).

Sir,—I feel obliged to point out an error in Mr. J. A. Wightman's article (*Bull. Amat. Ent. Soc.*, **27:** 11) on insect semen transfer, in which he states that "land snails . . . transfer semen enclosed in calcareous 'love darts.' "

This is quite untrue. The exchange of darts merely stimulates the two snails to insert their cirri into each other's vagina (the genital atria being everted prior to the exchange of darts). Small spermatophores prepared in the flagellum travel through the cirrus (=penis) to the other snail's spermatheca.

17.2.68. Justin Jackson (3873).

JUNIOR NEWS SECTION

Hello everyone. When you read this you should all be enjoying a glorious Summer so please flood me out with reports!

Here are the answers to the Spring Quiz:—

1. This was a catch question for, as I am sure you all know, it is the larvae of the Clothes Moth (*Tineola bisselliella* Hummel) which eat cloth. The adults eat nothing.
2. A drawing was wanted here of an orange and black Rainbow Rove Beetle (*Paederus littoralis* Grav.).
3. Coleoptera (Beetles) pass

through complex metamorphosis, Dictyoptera (Cockroaches and Mantids) through simple metamorphosis, Phasmids (Stick and Leaf Insects) also simple metamorphosis and Aphaniptera (Fleas) strangely enough pass through complex metamorphosis.

4. Insects use their antennae mainly for smelling.

5. Three reasons why centipedes are not considered to be insects are (a) because they have far more than six legs, (b) their bodies are not divided into three definite parts—head, thorax and abdomen, (c) they never have wings.

6. The Glanville Fritillary (*Melitaea cinxia* Linn.) is very rare. It is only found on the Isle of Wight.

7. What have ruby lips to do with bees and bugs? Nothing now, but I believe that lipsticks were made out of bees' wax and crushed, red cochineal bugs.

8. You had to draw a Red Admiral Butterfly for this one.

9. Gynandromorphs are really strange. They are freak animals, sometimes insects such as moths, which are half male and half female.

10. *Anopheles* is the genus (first) name for a group of mosquitos which are infamous for spreading the disease, malaria. You will be surprised to know that at least five species of *Anopheles* occur in Britain.

11. Two orders of insects, whose members are characterised by having their back legs modified for jumping, are the Orthoptera (Grasshoppers and Crickets) and the Aphaniptera (Fleas).

12. I think it was quite a challenge to be asked to draw and colour the caterpillar of the Pale Tussock Moth (*Dasychirae pudibunda* Linn.).

13. June or, as they are sometimes called, May Bugs are, as I am sure you knew, beetles (Coleoptera). They are also known as the Common Cockchafer (*Melolontha melolontha* Linn.). Have any of you seen the large numbers of these insects which are supposed to be seen commonly all over England? I haven't.

14. Stone flies are rather ancient looking creatures belonging to the order Plecoptera. Their nymphs live under water, while the adults are often found doing nothing in particular except resting on waterside stones.

15. Once again you were called upon to draw and colour an insect. This time it was the Great Blue Underwing Moth (*Catocala fraxini* Linn.) also known as the Clifden Nonpareil. It is very large and rare.

16. In Britain we have seven species of social wasp all looking at first glance very much alike. They are the Common Wasp (*Vespa* (*Vespula*) *vulgaris* Linn.), German Wasp (*V. germanica* Fab.), Red Wasp (*V. rufa* Linn.) Norwegian Wasp (*V. norwegica* Fab.), Tree Wasp (*V. sylvestris Scop.*) the parasitic, Austrian Wasp (*V. austriaca* Panz.) and last but not least the Hornet (*V. crabro* Linn.)

17. *Ateuchus sacer* Linn. is the Holy Scarab Beetle which, with cats, was worshipped by the ancient Egyptians.

18. A picture of a Water Scorpion was required here.

19. If animals live in symbiosis they actually live in co-operation. For example ants obtain sweet fluids from aphids and in return protect them from their enemies.

20. Those of you who are helping the Nature Conservancy with the National Lepidoptera Recording Scheme should send your records to me or, preferably, to the Biological Records Centre, Monks Wood Experimental Station, Abbots Ripton, Huntingdon.

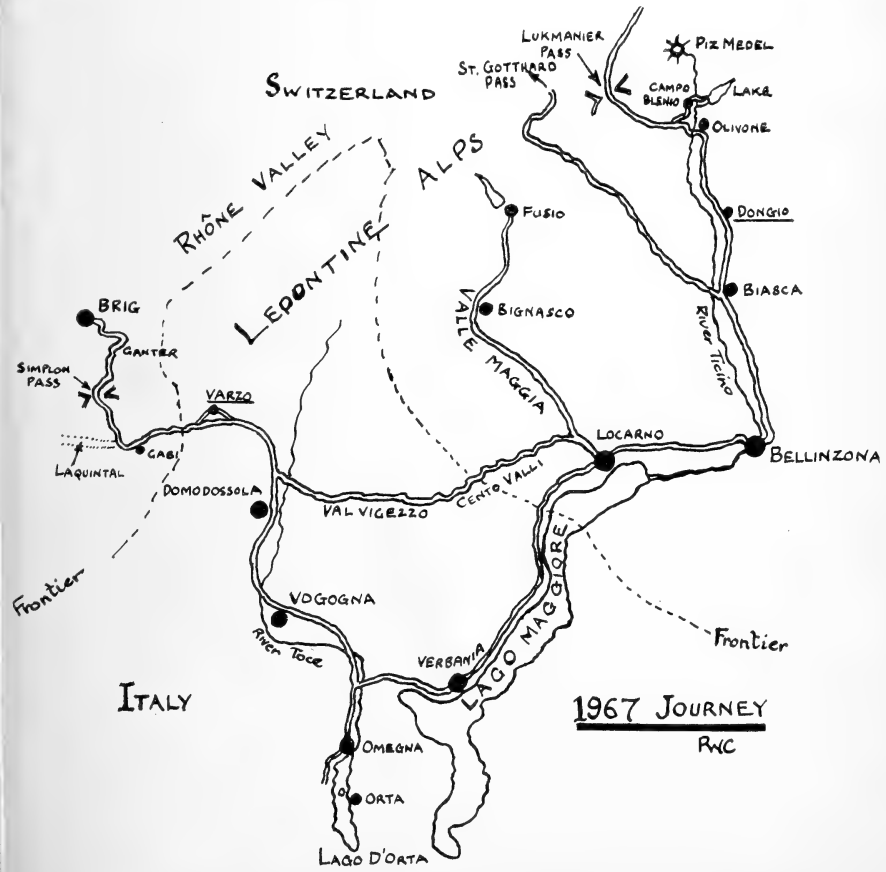
I am sorry I cannot include a list of winners in this issue but I am sure they won't mind waiting until next time. See you all at the Autumn Exhibition.

25.4.68. H. J. Berman, F.R.E.S. (2971A).

SOUTHERN SWITZERLAND AND NORTH ITALY—1967

Following up our 1966 expedition to Switzerland, W. L. Coleridge, Raymond Uffen and I arranged a further trip for 1967, this time a fortnight earlier than in 1966 and the area to be south of the mountain range over which the Simplon and St. Gotthard Passes lie (the Lepontine Alps). We left Dover on the 30th June and travelling overnight by Auto-couchette from Calais Ville we arrived at Biasca in the Ticino Canton of Switzerland early on the 1st July. Coleridge had again provided the car, a new Hillman Hunter, and the car was able to show its worth over the next fortnight on some hazardous roads covering some 900 miles. Our first stay was at a small Hotel in the village of Dongio on the road leading from Biasca to the Lukmanier (Lucomagna) Pass. All the passes and many of the villages have dual names—Italian and German—which can lead to some confusion. Not knowing anything of the area, we were obliged to sample to find suitable collecting terrain.

Most of the valley areas are meadowland and these are rich in flowers but are regularly cut and harvested for winter fodder and the insect population consequently suffers. However there are still many



more species flying than one would see in an English meadow and our first sortie was amongst some of these meadows just below the village of Olivoni on the way to the Pass. The torrent ran below the meadows which terraced down to it from the roadway. Grass cutting was in progress but in the uncut areas of grass, blue Salvias, Lilies and a host of other flowers there were flying plenty of the large Apollo, *Parnassius apollo* Linn., the Marbled White, *Agapetes galathea* Linn. and the Dark Green Fritillary, *Mesoacidalia charlotta* Haw. There were also a few Black-veined Whites, *Aporia crataegi* Linn. about but these were past their best. The Dingy Skipper, *Erynnis tages* Linn., was very common and we also took a few *Pyrgus cirsii* Rbr. The only Blue present was the Mazarine, *Cyaniris semiargus* Rott., and this was plentiful in both sexes. In the small wooded areas near the stream were some newly emerged Ringlets, *Aphantopus hyperantus* Linn., and where the grass was lying cut in the meadow there were fresh Meadow Browns, *Maniola jurtina* Linn., some of which I collected for George Thompson of Perth. One new species for me was the White, *Pieris mannii* Mayer, which is very like the Small White, *P. rapae*. As both species fly together it was difficult to assess how common each species was. We found the sun very hot and after a meal we decided to go up the Pass. After a drive along an excellent new road climbing up the pass we reached the old roadway which is still in the course of being rebuilt. Here we stopped where the road passed through a wood of tall Spruce. Climbing up the slope at the side of the roadway we found a path leading out onto some rough meadows through which a small steam trickled. In the boggy patches were Cotton Grass and small groups of orchids and some interesting butterflies. The altitude was between 4,000 and 5,000ft and the spring butterflies of England were on the wing in this first week of July. The Chequered Skipper, *Carterocephalus palaemon* Pall., the Small Pearl-Bordered and Pearl-Bordered Fritillaries (*Clossiana selene* Schiff. and *C. euphrosyne* Linn.), the Orange Tip, *Anthocaris cardamines* Linn., were flying together with the later species *Maculinea arion* Linn. and *Mellicta athalia* Rott. I netted some of the latter which laid batches of eggs for me in pill-boxes having a leaf of *Plantago lanceolata* Linn. in them. This was done while the boxes stood in the hotel window the next day. Species new to me here were the Wall, *Dira petropolitana* Fab., and the very local Fritillary, *Clossiana thore* Huebn. This latter insect is of the shape of *C. euphrosyne* but the upper side is heavily suffused with black and the underside has purple markings. The only Erebia present, *Erebia ceto* Huebn. (=*alberganus* de Prun), was just emerging here. On a small slope by the road there were several large clumps of Horseshoe Vetch (*Hippocrepis comosa* Linn.) and on these I found two larvae of the Chalkhill Blue, *Lysandra coridon* Poda. They were nearly full fed but later produced small hymenopterous parasites from a mass of white cocoons, rather like those of *Apanteles glomeratus* Linn.

Later in the week we decided to try higher up the pass and drove up near to the top where the pass opens up and overlooks wide meadows, fringed on one side by tall Spruce and on the other by a rocky chaos clothed in *Rhododendron ferrugineum* Linn. The meadow area was reasonably flat with small streams cutting across it leaving small bogs and pools. Down the centre of the plain ran a fairly large stream coming from the glaciers in the distance. Heavy grazing had taken place and there were large herds of cattle among the trees and on the slopes around. By the stream

we found the small Apollo, *Parnassius phoebus* Fab.; they were flying along the stream edge and resting occasionally on the small flowers growing by its banks. I took one female which appeared to be about to deposit her eggs on some plants of *Saxifraga aizoides* Linn. right by the water's edge. There were a few Chequered Skippers about but apart from a few *Pieris bryoniae* Ochs. wandering through the woodland this area was very short of butterflies. I crossed the valley and climbed up where the chaos of rocks formed a rugged wall. Among the rocks were growing a little yellow violet, *Viola biflora* Linn., and *Primula farinosa* Linn. The only butterflies here were the small Tortoiseshell, *Aglais urticae* Linn., and *D. petropolitana*. It seemed that we were perhaps a little early for the butterflies at this altitude. The area would certainly merit a visit a few weeks later as it is quite wild and unspoiled apart from the grazing.

At the Hotel in the evenings we spent our time setting the day's catch, interrupted by a terrific storm each night which filled the mountains with rolling thunder while the rain torrented down the village street. Sometimes the lights failed and we could do nothing. Before the storm one evening I had a look round the street lights and watched a bat at each catching the moths that came into the light. The only moth which seemed to be immune was an orange footman with black spotting which was all about the hotel walls in the morning. As these moths flew past one, they emitted an audible crackling sound and this possible 'anti-bat' device may have been the reason for their safety.

Our next area for collecting was in a hidden valley near the village of Campo Blenio. The valley was reached by passing through a mile long tunnel behind the village of Olivoni. This area was a real find. The stream ran down through the bottom of the valley coming from the glacier on the Piz Medel and the road ran up to the village of Campo Blenio and a small roadway off it carried on to the top of a huge barrage which contained a vast lake, a source of hydro-electric power. The whole valley was rich in flowers and butterflies. The Lycaenids were well represented and included the Small Blue, *Cupido minimus* Fuessl., the Large Blue, *M. arion* Linn., *Glaucopsyche alexis* Poda. (rather worn), *Lysandra dorylas* Schiff., *C. semiargus* Rott., and the rather local *Cupido sebrus* Huebn. By the stream side were flying newly emerged Purple-edged Coppers, *Palaeochrysophanus hippothoe* Linn., being much larger specimens than usual for the sub-species *eurybia* Ochs. Another Copper flying in the area was the sub-species of *Heodes tityrus* Poda, ssp. *subalpina* Speyer. These were newly emerged also and I took both males and females. They are both very dark on the upper side and show no 'copper' colouring. There were large patches of the field geranium, *Geranium sylvaticum* Linn., and hovering over the flowers was another Blue, *Eumedonia chiron* Rott., whose larvae feed on the flower and seed heads of the plant. All the slopes and meadows abounded in *Erebia ceto* Huebn., very large specimens with fine markings. I also took one male *Erebia ligea* Linn. Where one of the streams spilled across the road there were several Chequered Skippers settling to sip at the water and here I also saw the Painted Lady, *Vanessa cardui* Linn., the Peacock, *Inachis io* Linn., and one *Nymphalis polychloros* Linn. The Fritillaries included *Mellicta perthenoides* Kef., *Melitaea diamina* Lang, *M. didyma* Esp. and *Clossiana titania* Huebn. We spent several mornings in this area as there was plenty of collecting terrain and the flowers and insects were profuse. The view of the snow

capped mountains at the far end of the valley tempted Uffen and I to make the long journey beyond Campo Blenio to explore the area of permanent snow. One morning we left Coleridge collecting in the valley, while we climbed up the winding pathway which passed first through flowery meadows and then into a grassy valley below a waterfall which came down over the rocks to form the stream. We found a marked pathway up the rocky slope and by this were able to climb above the drifts of snow and reach the more rugged ground. Here there were large clumps of Alpine Dock, *Rumex alpinus* Linn., a plant as large as our Water Dock, *Rumex hydrolapathum* Huds. There were drifts of Rhododendron and plenty of Gentians and other high alpine flora and *Pieris bryoniae* Ochs. was flying everywhere. I netted a specimen of the high mountain Blue, *Albulina orbitulus* de Prun (*pheretes* Hffsgg), and one or two *Aricia allous* G.-H. There were several of the high-mountain Colias, *C. phicomone* Esp., chasing each other up and down the steep slopes but giving chase was out of the question. On one slippery patch where algae were growing on the wet rock face I pitched face first and bruised my chin badly, a warning to watch my step. The hope that this area might produce some of the higher level Erebias was at last realised with the capture of a male *Erebia tyndarus* Esp. and I then took two specimens of *Erebia pandrose* Bkh. (*lappona* Esp.). This is a very beautiful Erebia rather like a large *E. tyndarus* on the wing. I had taken it previously on the Lautaret in the French Alps and at Bareges in the High Pyrenees. These specimens were perfect and our fears that we were rather early for butterflies at the higher altitudes seemed correct. Some cloud began to obscure the sun and this quickly puts the Erebias down so we made our way back towards Campo Blenio and the car. On the way down I had an excellent view of the Alpine Marmot (*Marmota Marmota* Linn.) perched on a huge rock. He watched me until I was about thirty yards away and then shot down under the rock. As I looked back some fifty yards further down the hillside I saw him back on his vantage point and a single scream from him was echoed by others high up on the far slopes of the valley. The only other life in this high valley were the dry cows and heifers grazing by the pathside and the solitary herdsman and his dog. Raymond Uffen had taken one specimen of the beetle, *Emus hirtus* Linn., coming to fresh cow droppings and on the bridge over the stream we captured two Tiger beetles, *Cicindela hybrida* Linn. Coleridge had done quite well in the flowery meadows lower down taking *Lysandra bellargus* Rott. and *Colias hyale* Linn.

On the day before we left Dongio we made a special sortie down to Lake Maggiore via Locarno and up the Valle Maggia in order to get to the remote village of Fusio, a recorded locality for a very local Erebia, *E. flavofasciata* Heyne. The first half of the valley was level driving and then we started to climb beyond Bignasco. The road soon overlooked the gorge at the bottom of the valley and we stopped for lunch at a spot where the road widened. There were ravens nesting on the opposite side of the ravine and just above the road we found some little alps hidden by the roadside trees and bushes. These were alive with butterflies and there were fresh specimens of the Copper *Heodes alciphron* Rott. (ssp. *gordius* Sulz.) and badly rubbed Green Hair streaks, *Callophrys rubi* Linn. I saw one of the large Satyrs, *Satyrus bryce* Huebn. (*cordula* Fab.), motionless on a flower head. On closer inspection I found it to be dead, held in the grip of a wonderful rose coloured Cra

spider. *Hipparchia fagi* Scop., one of the largest Satyrs, was also flying on the rocks by the alps and I took my first specimen of form *cleodoxa* Ochs. of the High Brown Fritillary, *Fabriciana adippe* Rott. As we drove further on along the valley the road began to climb sharply by means of a series of acute hairpin bends—we counted thirty-two in all—until at last we reached the outside of the village of Fusio. Here we stopped to explore some small gulleys by the roadside, full of flowers and lush grass. The Black-veined White was very common and in good condition and there were *Erebia ceto*, *E. euryale*, and a few *E. ligea*. A new Erebia to me, *E. medusa* Schiff., was also present in fair numbers but in a very rubbed state. I also took *C. selene* and *M. diamina*. Unfortunately the sun was partly shaded and although quite a lot of butterflies were flying, many more appeared to be resting and had to be put up. We drove through the village of Fusio, perched on the mountain side, and then a short way up the road leading to the great dam above the village. It was here that we hoped to find *E. flavofasciata* but we only found species which we had found lower down, although the flowers were some compensation—Lilies and Orchids, Gentians and Mountain Asters. By 4 p.m. the sun had got behind the peaks and we returned down our thirty-two bends to the valley and again past the Lake to Dongio, a round journey of nearly 150 miles.

On the day that we left Dongio to go into North Italy the heavens opened and we had the only wet day of our holiday. It poured hard all day and a heavy mist filled the valleys and shrouded the lake. Beyond Locarno we took what appeared to be the shortest route to Domodossola, over the mountains via the Cento Valle road. This proved to be a mistake in the conditions. Rain and mist made visibility bad and the road wound, climbed and twisted its way across the face of the mountains and it was impossible to hurry. Just beyond the Italian/Swiss frontier post we nearly had a collision with a fast moving car coming round a corner towards us and in taking avoiding action we suffered our only mishap, the rear wheel skidded off the road and the rim struck a projecting rock giving us a good jolt and the rim a nice dent. We tried the villages round Domodossola for a likely hotel but in the end decided on the Hotel Tronconi, the only one in the village of Varzo which had once been on the approach to the Simplon Pass but now lay in a back water with the pass lying well below the village. The hotel was huge with only a handful of guests and we were well suited. The village had seen better days—many of the gardens had exotic trees and plants growing in them, mural paintings decorated many of the walls of the houses and there were numerous shrines and chapels of ease, though only the village church seemed to be in use. We had the advantage of a quick route to the mountains and an equally easy one to the Italian plain.

The following day the weather returned to brilliant sunshine and we drove over the Simplon Pass to Ganter Bridge on the North side where we had been in 1966. The little valley beside the bridge is always alive with butterflies and this morning was no exception. The Blues, *Lysandra coridon* Poda, and *L. escheri* Huebn. were newly emerged; the latter is like a large Common Blue, *P. icarus* Rott. There were also several of the smallest Apollo, *P. mnemosyne* Linn., flying but these were in a bad condition. I was also pleased to find the small Fritillary, *Mellicta aurelia* Nickerl., and the Satyr, *Hipparchia alcyone* Schiff., like a small version of *H. fagi* Scop. Coleridge and I then climbed up through some meadows

and into a copse of Spruce through which there ran a wide glade. Very quickly we found that very local Blue butterfly, *Plebejus pylaon* Frhst. which was flying along the glade, the males very actively on the wing and the females on the food plant *Astragulus exscarpus* Linn. which grew in tufts along the path and on the grass edges of the woodland. We took about half a dozen specimens in quite good condition. I also netted a specimen of the small Cicada and photographed a female Wood White, *Leptidea sinapis* Linn., laying her eggs on a species of Vetch. The sun was very hot and we were bothered by a very large biting fly which had one or two goes at my legs before I netted it. Back by the stream we found several of the Spanish Fly beetle, *Lytta vesicatoria* Linn., settled on small Alders (*Alnus* sp.). There was one pair in copulation, the male being about half the size of the female. It is a very beautiful beetle, being metallic green. I also took a very fine variety of the Purple Edged Copper, *P. hippothoe*, with the underside spots run into long streaks. After our meal we drove back to the top of the Simplon and collected for a while in the valleys near the Hospice. I took several specimens of the Scottish Burnet, *Zygaena exulans* von H. and R., and the Fritillary *Euphydryas glacigenita* Vty, also some newly emerged males of *Erebia epiphron* Knoch. I also saw a passing specimen of *Synchloe callidice* Esp. but this species flies so fast that I failed to net it. It clouded over and began to rain a little and not even Uffen's smoker would move anything out of the scrubby undergrowth so we called it a day and drove back to the frontier where we changed our Swiss Francs for Lira and returned to the hotel for some setting and dinner.

P. W. Cribb (2270).

To be concluded.

LUCANUS CERVUS Linn. (MALE)

This is perhaps one of the most well known of all British insects. Instantly recognisable because of its size and formidable looking jaws—which are capable of giving a very firm nip. During warm evenings in late May and June the Stag Beetles can be seen crawling about or flying in an almost upright position; they are also attracted to light, like most scarabid beetles.

The female is similar in size and shape to the male but does not possess the large head and mandibles.

For an account of the distribution of this species one should read the excellent paper by D. G. Hall "*Distribution of the Stag Beetle in Britain.*"

The larvae take three or four years to reach maturity and can be found in the roots and trunks of certain rotting hardwood trees.

24.4.1968. Jonathan Cooter (3290).

REFERENCE

HALL, D. G. (1964). Distribution of the Stag Beetle in Britain. *London Naturalist*, **43**: 67-72.

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THE AMATEUR ENTOMOLOGISTS' SOCIETY

ANNUAL EXHIBITION, 1968

SATURDAY, 5th OCTOBER

from 2 p.m. to 5.30 p.m.

HUGH MYDDELTON SECONDARY SCHOOL,

Corporation Row, London, E.C.1

ADMISSION FREE

EXHIBITS. The Hall will be open from 11.30 a.m. for receipt of exhibits. Bring along your specimens (any Order, living or set), equipment, apparatus, photographs, drawings, etc. If you require a large space, notify the Meetings Secretary in advance. Please label exhibits clearly.

DEMONSTRATIONS. Members will demonstrate setting of insects of several Orders.

GROUPS. Members of Groups who have been corresponding will be able to meet for discussion.

SURPLUS TABLE. If Members have spare ova, larvae, imagines, equipment, books, etc., for sale or exchange, bring them along labelled with name, price or exchange wants. No charge for use of this table.

ENTOMOLOGICAL TRADERS will be in attendance.

Light Refreshments will be available

Offers of help and enquiries to Hon. Meetings Secretary, B. F. Skinner, 85 Elder Road, West Norwood, S.E.27. GIPsy Hill 0057.

BRING YOUR FRIENDS AND AN EXHIBIT !

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Notice is hereby given that neither the Amateur Entomologists' Society nor the Inner London Education Authority can accept any liability for damage to vehicles or property which are left in these grounds

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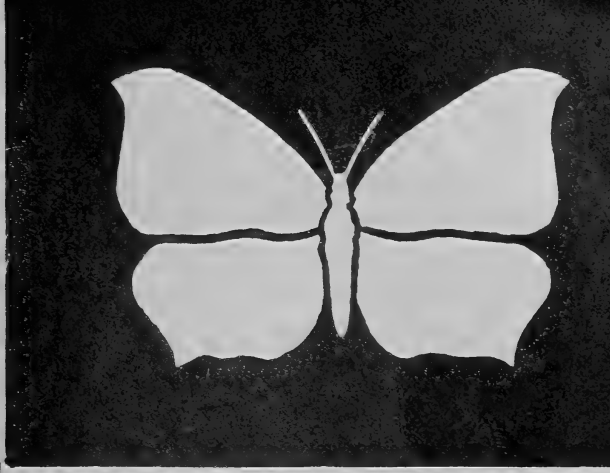

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EDITED by DAVID CORKE, B.Sc., L.I.Biol.

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AES
BULLETIN

No. 281
NOVEMBER, 1968

EDITORIAL

Now is the time of year when many entomologists will be turning from the outdoor to the indoor part of their hobby. I hope the summer has been a successful one and has provided you with plenty of interesting observations and specimens to identify. Before the period of hibernation (for most entomologists as well as the insects) has finally set in do please make an effort to write up some of your observations for the *Bulletin*.

I am especially pleased that the preliminary report of the Nature Conservancy's Lepidoptera Mapping scheme appears in this issue. Schemes of this sort offer an excellent opportunity for co-operation between amateur and professional naturalists.

I am sure that all lepidopterists will make an extra effort in the coming season to fill in some of the gaps on these maps.

D. Corke (2962).

●

COLLECTING NOTES NOVEMBER 1968

The Smaller Moths

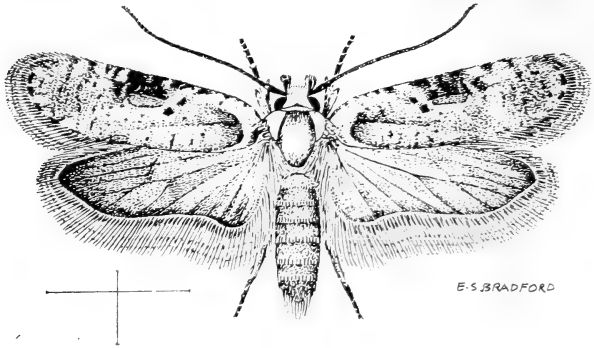
Agonopterix (*Depressaria*) *alstroemeriana* Clerck.

Mr Bradford writes as follows: "I have never, so far, found this to be a common moth, although it is said to be so. Perhaps I have not found the right spot. The drawing is from a specimen taken in Hertfordshire, the food-plant, Hemlock (*Conium maculatum* Linn.), growing in the area. I took the moth on October 3rd. The head and thorax are white. The forewings are a light ochreous brown suffused with white and with a speckling of black scales. In the middle of the costa is a blackish grey blotch with a dark reddish streak below it and a black stigmal dot next to it. The hindwings are a pale ochreous grey."

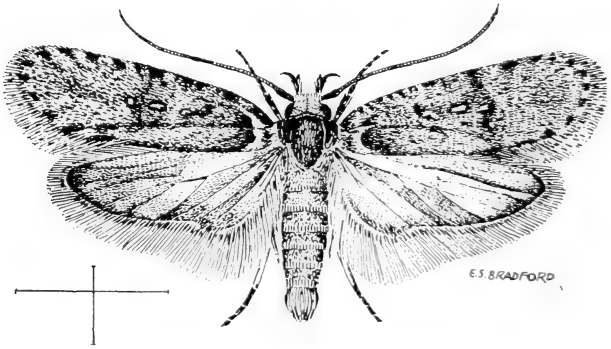
A. (*D.*) *applana* Fab.

Mr Bradford's note reads as follows: "I have a number of this common moth, but like many common things it is one I have not yet bred. The drawing is from one of several specimens taken at Wymondham in Norfolk. With friends I was inspecting a dilapidated old house and I found numbers inside and out. They seemed to be scuttling everywhere. When disturbed they dart and shoot about, sometimes on their backs, in quite a random fashion. This is a protective device to escape their enemies as exactly where they will be in the next second is unpredictable. I took these specimens on October 15th. I have taken other specimens in March, April, August and September. Nearly all my specimens are of the same lightish fuscous colour with three whitish spots along the middle of the forewings, sometimes obscure. The hindwings are a lightish brown grey. The larvae feed on the rolled leaves of, among other things, Cow Parsley (*Anthriscus*), Hogweed (*Hera-*

Front cover illustration: The ant and its aphids, drawn by Mr G. Thomson (3869).



Agonopterix (*Depressaria*) *alstroemeriana* Clerck.



Agonopterix (*Depressaria*) *applana* Fab.

cleum), Wild Angelica (*Angelica*) and Hemlock."

Both these species may be obtained throughout the winter by beating haystacks—now, alas, a rare feature of our countryside. I have found the larvae of *A. applana* feeding in spun flowers as well as in rolled leaves. They can readily be told from the larvae of other members of the group by the small black crescentic mark on the side of the head (technically the second segment). Perhaps I should mention that by the time this article appears in print the new Check List of the British Lepidoptera is likely to have been published, and then *A. applana* Fab. will have to be called *A. heracliana* Linn. and the moth which at present bears that name will be known as *Depressaria pastinacella* Dup.

I have noticed that several of my friends, who in most respects have comprehensive collections of the smaller moths, possess relatively few of the Lithocolletidae. This is due to neglect, because most of the species in this group are widely distributed, readily found and easy to breed. Since the larvae pupate in their mines, the precise date for the collection of the autumn brood is not critical. November is not too late to collect a great many of the fifty species. It is generally easier to find the mined leaves while they are still on the tree, but fallen leaves containing larvae are sometimes conspicuous through the area of the mine retaining its green colour after the rest of the leaf has turned.

The wild imagines emerge in late April or May, but if the mines are kept out of doors until the end of January and then brought into a warm room, the moths will soon come out, thus providing entomological activity in the fallow months of the year.

I propose to deal in this article with the oak-feeders, since oak leaves fall late, and the mines may be collected till the end of November or later. There are nine species, two of which are very common, and, I believe, ubiquitous. These are *Lithocolletis quercifoliella* Zell. and *L. harrisella* Linn. (*cramerella* Fab.). To these I might add *L. messaniella* Zell. which feeds on the deciduous oak as well as the Holm Oak (*Quercus ilex* Linn.) though it has a preference for the latter. Two other species are less common, but I have been able to find them whenever I wished in the south of England. The first is *L. heegeriella* Zell., which makes a small mine usually under a lobe of the leaf. The other is the beautiful *L. lautella* Zell., which seems to be confined to the Durmast or Sessile Oak (*Quercus petraea* Liebl.); this species of oak may be distinguished by the leaves which taper without auricles or lobes on to rather longer stalks. *L. lautella* prefers saplings or low bushes; I once found it plentifully in the shoots springing up round the stump of a felled tree. I have yet to encounter the other four species. *L. roboris* Zell. is very local but has a wide range. *L. distentella* Zell. seems to be predominantly a moth of the Midlands, though I have been told that it has been taken in Kent. The West Midlands, too, are the headquarters of *L. amyotella* Dup., which is reputed to feed in the topmost leaves of tall trees. The best chance of obtaining it, therefore, is to search for mines among fallen leaves in mid-winter. The last species, *L. hortella* Fab., has a fairly wide range in the south of England, but seems to be far from common; like *L. lautella*, it is said to prefer the Durmast Oak.

The best chance, then, of obtaining the rarer species is to collect mines from different species of oak growing in varied situations and to include a proportion contained in fallen leaves. The mines should be kept out of doors in linen bags, or spread on earth in seed-boxes. If you adopt the latter method, a lid is necessary to prevent the leaves from blowing away. I use another seed-box, raised on slats to allow ventilation and weighted down with a brick; this method has proved very successful.

A. M. Emmet (1379).

Hymenoptera Aculeata

The Hymenoptera number many, in fact a majority of, parasitic species among their ranks, and equally they are subject to parasitism. Among the Aculeata, many species have developed a specialised form of parasitism which they practise on species related, often closely, to themselves. These are the so-called inquiline, or cuckoo, species. Other insects also make use of the stores of animal or

plant food laid up by Aculeates, either directly or by eating the hymenopteran larva when it has developed. Fewer are endoparasitic on the hymenopteran larva and yet fail to kill it and are carried over into the adult. One particularly fascinating group in this last category are the forms commonly called *Stylops*.

This group has a particular interest for British entomologists as a male *Stylops* appears in the seal of the Royal Entomological Society of London. It was the Rev. William Kirby who first described the Strepsiptera, the order erected to contain *Stylops* and its relatives. He was also the first Honorary President of the Society and is one of the people best qualified to receive the title "Father of British Entomology." When in 1932 the Society commenced a serial publication for taxonomic work they named it 'Stylops' and so it appeared for four years, after which it became the Proceedings Series B, Taxonomy, that we know today. To carry the association to its most recent manifestation, a male *Stylops* was chosen as the Congress crest for the 12th International Congress of Entomology held in London in 1964.

So much for associations, now for the actual insect. *Stylops* are best known in this country as parasites of bees of the genera *Halictus* and *Andrena*. The female parasite can be seen as a light brown head protruding from beneath the hinder abdominal tergites of the host. She is reduced to little more than a sack of eggs within the host body which she never leaves. The male *Stylops* is a free flying insect that emerges from the body of the host leaving a gaping hole. Several parasites can develop within one host and I recently saw a female *Andrena helvola* (Linn.) taken by Lt. Col. C. A. W. Duffield at Brook, Kent, with one female *Stylops* visible as well as with the exit holes of two males in her abdomen.

The life cycle of the parasite is most interesting. The male fertilises the female while she is in the host. The eggs hatch within the body of the female and emerge as active triungulin larvae similar to those of the beetle family Meloidae. These larvae presumably move onto the flowers visited by their host to pass onto fresh hosts and are thus carried back to new nests where they enter the bee larva when it develops. Members of the Stylopoidea attack not only bees but also solitary and social wasps, and outside the Hymenoptera certain Homoptera Auchenorrhyncha, particularly of the family Delphacidae.

The taxonomic position of the Stylopoidea has been the subject of much discussion, which is hardly surprising in a group so highly modified for its parasitic mode of life. The two common courses are to place the group in a separate order, the Strepsiptera (Imms, 1957) or as a superfamily within the Coleoptera Polyphaga (Crowson, 1956). This latter course is further argued by Crowson (1960). The extreme reduction of the fore wings of the male *Stylops* to haltere-like structures is certainly not appreciably more extreme than the reduction of the elytra in the beetle *Atractocerus brevicornis* (Linn.) which I have taken at light in Rhodesia.

Imms (1957) includes an excellent, concise account of the group with ample reference to the available literature. This is not extensive, and little attention has been paid to *Stylops*, at least in this country, for many years. This is where AES members can help. Mr Bruce Ing is at present working on the group with a view to bringing out a part in the series of *Handbooks for the Identification of British Insects* published by the Royal Entomological Society. The occurence of *Stylops* in bees is very rarely noted in the literature, and I

know that Mr Ing will be most grateful for any information, records or specimens that readers are able to supply him. His address is:

Mr Bruce Ing,
27 Gallows Hill,
King's Langley,
Herts.

It is a pity more notice has not been taken of stylopised specimens if only because the presence of the parasite alters not only the physiology but also the morphology of the host. Thus stylopised specimens can be difficult to identify. The changes have one particularly fascinating aspect. The tendency is for both sexes to lose the particular adaptations typical of their sex. Thus females may have reduced pollen collecting apparatus and males in, for instance, species which normally have a yellow clypeus, may have the extent of the yellow reduced.

29.7.68. J. C. Felton (3740).

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●

OBSERVATIONS ON BREEDING *CLEPSIS COSTANA* FAB.

During the early part of May 1965 I collected some *Clepsis costana* Fab. larvae from Willowherb (*Epilobium* sp.) at Dovedale on the Derbyshire/Staffordshire border. The larvae were of a similar shape to those of *Olethreutes lacunana* Dup., but the colour was a dark chocolate brown, with spots and the spiracular lines a pale brown to whitish. I took these larvae home to St Austell, Cornwall and for convenience changed the food-plant to a different species of *Epilobium*. The whitish spots became less distinct as the larvae reached maturity. Some of the larvae produced, in due course, hymenopterous parasites and died, but about a dozen others duly pupated and produced imagines in June 1965. All except two of the moths were more or less of the normal colour and size and looked like the illustration published in the *Bulletin* (*Bull. amat. Ent. Soc.* **27**: 39). Of the remaining two, one was melanic with the whole of the forewings a greyish black colour obscuring the normal markings (the hind-wings being only slightly greyer than normal). The other moth appeared to be about halfway between the melanic and the normal forms. Several matings of the typical moths were obtained and the imagines of the next generation emerged in August 1965. These imagines (a total of about twenty to thirty) were smaller than usual for *C. costana*—and every single one was melanic! These also mated, and many of the surplus larvae were released on Willowherb in my garden in September/October 1965, to give them a chance to hibernate in natural conditions. Unfortunately the larvae which I retained in captivity all perished due to unknown causes during the winter.

Had I been able to continue the breeding experiments of 1965-6 through further generations I would have been able to discover whether the melanism was genetic in origin or whether it is connected with smallness and a life cycle of less than the normal twelve months. In the absence of further evidence I would prefer to compare the melanism in *C. costana* with the colour differences between the first and second broods of *Selenia bilunaria* Esp. than with the dominant genetic melanics of such species *Biston betularia* Linn.

In February and March 1966 I searched in my Willowherb for the overwintered larvae which I had released the previous autumn, and

was able to find only one larva which eventually produced a moth of the normal, typical form in June 1966.

One night in May 1966 I was trying to assemble a male *Eulia ministrana* Linn. to a freshly emerged female of that species in my assembling cage. On looking into the cage the following morning I found not a male *E. ministrana* but a male melanic (!) *C. costana* in the cage with my female *E. ministrana*, which subsequently laid eggs that proved to be infertile. I do not know whether copulation had actually taken place, but I have no doubt that this assembled male *C. costana* was from one of the larvae I had released earlier.

On looking at the specimens of *C. costana* in the British Museum (Natural History) collection in London in October 1966 I noticed that nearly all seemed to be of the normal form, and only two or three melanic. In the published literature (Ford 1949) it is stated that *C. costana* has only one generation per year, but in my experience of this species in captivity there are two generations per year. I would be very interested to know whether anyone else, with experience of breeding *C. costana*, could supply answers to the following questions (either to me personally, or in the *Bulletin*):

1. Does *C. costana* always produce only one generation per year in a state of nature?

2. When second broods of *C. costana* are raised in captivity are they always small and melanic?

3. In the Tortricidae, is it usual for female scent of one species to be attractive to a male of another species?

4. Are there any known cases of hybridisation in nature among the Tortricidae?

9.6.68. John L. Gregory (4116).

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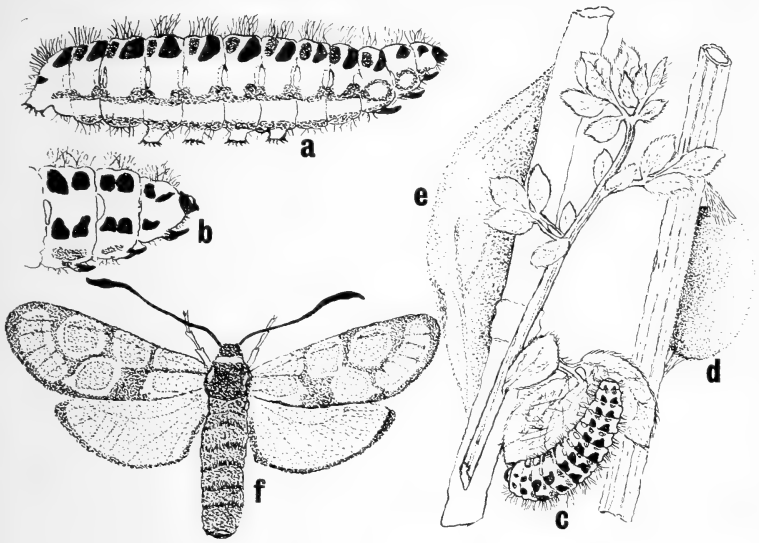
NOTES ON BREEDING *ZYGAENA CARNIOLICA* SCOP.

The burnet moth *Zygaena carniolica* Scop. is widely distributed in Central and Southern Europe, North Africa and Western Asia. This attractive species is often abundant in its flight places, and this together with the great variation in markings from one specimen to another, has caused the species to be much studied.

During the third week of August 1967 a number of worn female moths were collected in late afternoon from screes on the south side of Col d'Ornon near Entraigues some fifty km southeast of Grenoble, France. The locality was a narrow defile with a road and fast flowing stream at the bottom. The sun had almost left the lower slopes and the only Lepidoptera still flying were these Burnets. Several individuals were often seen on the same thistle flower jostling for the best position. Capture was easy and the females were placed in a small jar with some leaves of *Dorycnium* sp. Ova were laid almost immediately on the leaves and the walls of the container. They were similar in colour to those of *Z. lonicerae* Esp. (Narrow-bordered Five-spot Burnet) but slightly smaller and laid in groups of six or so. *Z. lonicerae* lays very large batches of ova in captivity as well as smaller groups scattered around the cage.

On returning to England the ova were kept in a warm room and hatched in nine days. The larvae were very dark—much darker than those of *Z. lonicerae* for example. Seitz (1913) mentions *Hedysarum*, *Dorycnium* and *Astragalus* as foodplants and Kirby gives *Astragalus glycyphyllos* Linn. (Milk Vetch, Wild Liquorice) and *Onobrychis sativa* Lam., (=*O. viciifolia* Scop.) (Sainfoin). The trefoils (*Lotus* sp.) are not specifically mentioned as foodplants, however the



(a) *Z. carniolica* larva, X1½. (b) *Z. lonicerae* larva, X1½. (c and d) *Z. carniolica* larva and cocoon. Natural size. (e) *Z. lonicerae* cocoon. Natural size. (f) *Z. carniolica* adult, X1½.

young larvae took readily to *Lotus corniculatus* Linn. (Bird's-foot Trefoil), but grew very slowly and once in the second instar became torpid. They were then transferred to a cold room at 4 °C and left there for almost seven months until the middle of April 1968. On placing on trefoil growing in a pot they underwent a further ecdysis and commenced feeding, to reach maturity by mid May. The full grown larva is slightly smaller than that of *Z. lonicerae* and with similar markings along the back except that the second spot on each segment is grey rather than black. The ground colour is bluish-green. Laterally are a series of yellow spots and below these U-shaped grey areas. Anteriorly these grey markings form two distinctive circles on the thoracic segments.

At each ecdysis a large silken pad was constructed on which the larvae hung downwards for several days before effecting the skin change. The ovate cocoon was constructed on grass stems provided and was considerably smaller than that of *Z. lonicerae*. It was white with the appearance of unglazed porcelain and free of the folds seen in the cocoons of many other Zygaenidae. The general shape and smooth outline made the cocoon closer to the form found in the Eggar moths than to *Z. lonicerae* or similar burnets. Due to the well-rounded appearance of the cocoon the area of attachment to the stem was small, and "hold-fasts" of thick silk strands anchored both top and bottom.

The pupal stage lasted about ten days. The adult is most striking with red spots centred in yellow rings. The antennae are strongly clubbed. The thorax is predominantly blue-black with some white hairs, and in addition two longitudinal and one transverse streak of white. The black abdominal segments are fringed in

blue hairs. The red hind wings are fringed in a narrow black band of even width.

The name-typical form of *Z. carniolica* has a red band on the abdomen. The form described here seems to come close to the description of aberration *hedysari* Huebn. figured in Seitz.

26.6.68. Keith Bradbury (2627).

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NOTES ON THE FLIGHT ACTIVITY OF *ORTHOSIA* (NOCTUIDAE, LEPIDOPTERA)

This article should perhaps have been included in the series on ecological approach to light-trapping as it stems from the same work. (*Bull. amat. Ent. Soc.* **27:** 29).

The genus *Orthosia* (Noctuidae) commonly known as Quaker moths, consists of nine British species though this study only covers six in some detail. All these species have a wide distribution in Britain and where they occur are usually common.

Over a four year period the dominant species was undoubtably *O. gothica* Linn. (Hebrew Character). It always emerged first, often a week or so before the rest, and appeared regularly in the trap till early June shortly after the other species with the exception of *O. incerta* Hufn. (Clouded Drab) had finished. The chart showing the flight periods (fig. 1) has been based upon the size of daily catches and not population estimates by marking or similar methods.

During the early stages of emergence of at least four species there appeared to be a low percentage of females (fig. 2). This could be accounted for by the earlier emergence

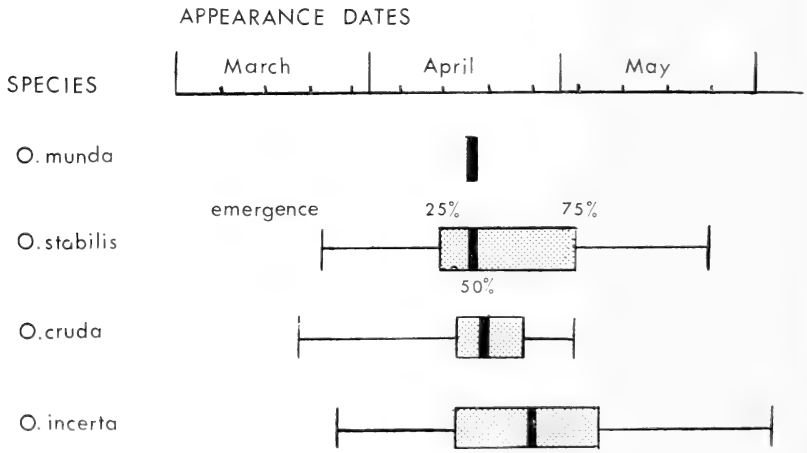

Fig. 1. The appearance dates and flight dates of six species of *Orthosia*.

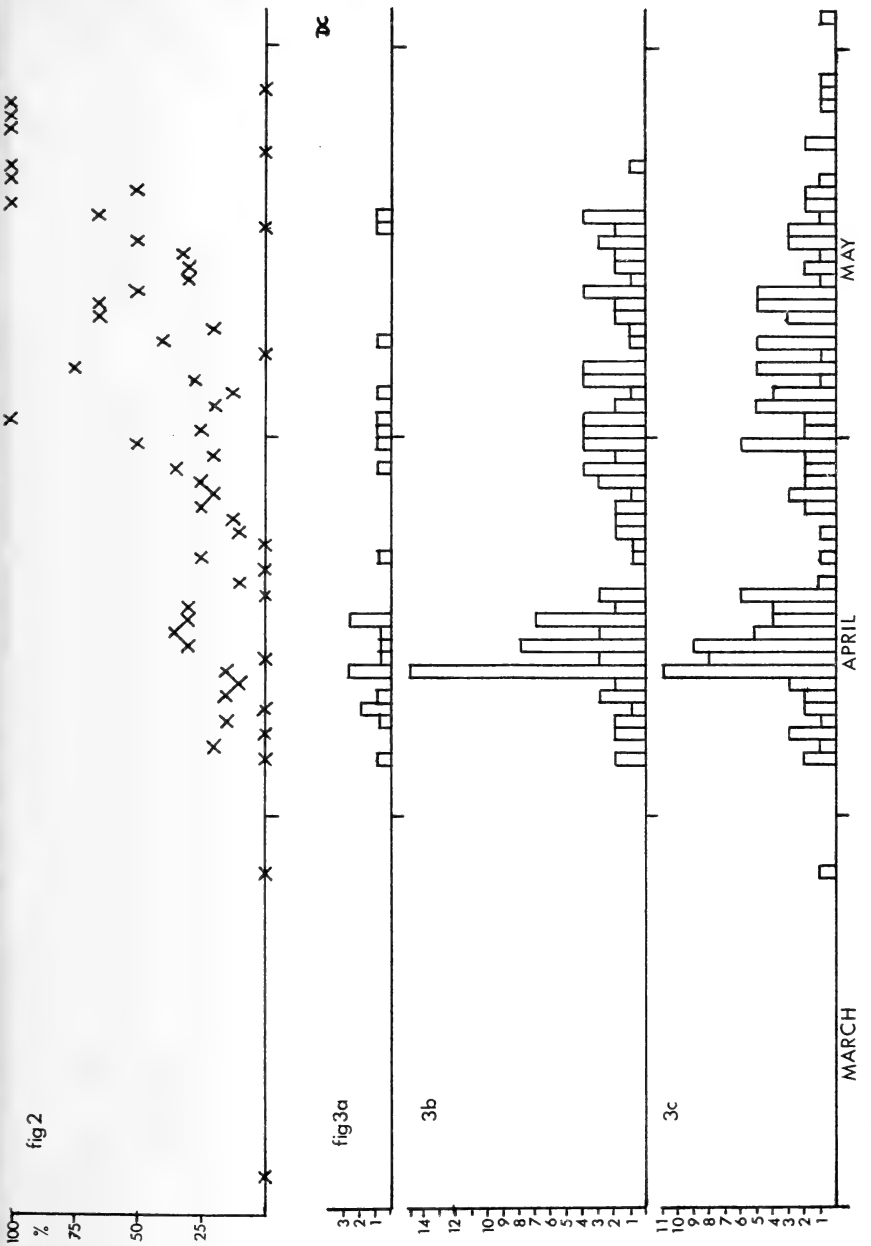

Fig. 2. A scatter diagram showing the percentage of females in each day's catch of *O. gothica.*
Fig. 3. Histograms to show the population changes in the three forms of *O. incerta.* a—light form, b—brown form, c—dark form.

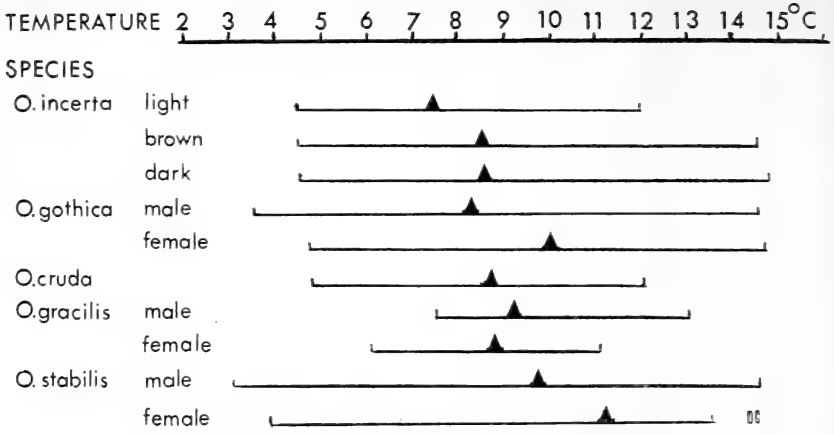

Fig. 4. Temperature ranges of five species of *Orthosia*.

and flight of males possibly in seeking their mates. After mating, active females would then, perhaps, alter their flight behaviour to coincide with a maturing and ovipositional process and so become more attracted to food rather than light sources and so avoid capture. Then again females by their nature of being heavier than males could have a reduced flying range and so appear less frequently in the trap.

The interpretation of insect flight response to air temperature has recently been reviewed in an article by Taylor (1963). The major difficulty of separating temperature effects on a fluctuating population and those of pure flight response were overcome by plotting the response at a particular temperature as either 1 or 0 depending on the presence or absence of individuals and not their numbers. In *O. gothica* the difference between these two approaches (fig. 5a and b) is not entirely obvious but it can be seen that the second is of more direct use. For instance the lower and upper temperature thresholds can easily be defined as the temperature at which there is a 50% flight response by the insect. In the case of *O. gothica* the lower threshold would be 43.5 °F. for the males and 45.0 °F. for the females. The upper values would be 56.0 °F. and 57.0 °F. respectively. In general females preferred warmer conditions than their male counterparts and the similarity of their temperature ranges can be seen in fig. 4.

All six species showed a similar pattern in their behaviour to wind force (figs. 6 and 7) as they preferred a slight breeze (force 2) in contrast to still weather. Further increases in wind force tended to reduce the flying population especially those of the female. *O incerta* and *O. gothica* were extremely wind tolerant and occurred frequently in the trap whereas *O. gracilis* Schiff. (Powdered Quaker) with a limited resistance appeared on a few isolated occasions. It would be reasonable to assume that the ability to withstand windy conditions is of some importance in this genus in controlling their flying populations.

O. incerta has a wide range of colour variation but can be divided into three distinct groups, those with light grey, brown or dark grey forewings. Moths with dark forewings represented 50% of those caught in the trap, while brown and light grey specimens formed 41% and 9% of the total respectively. The light grey form occurred at a low level through-

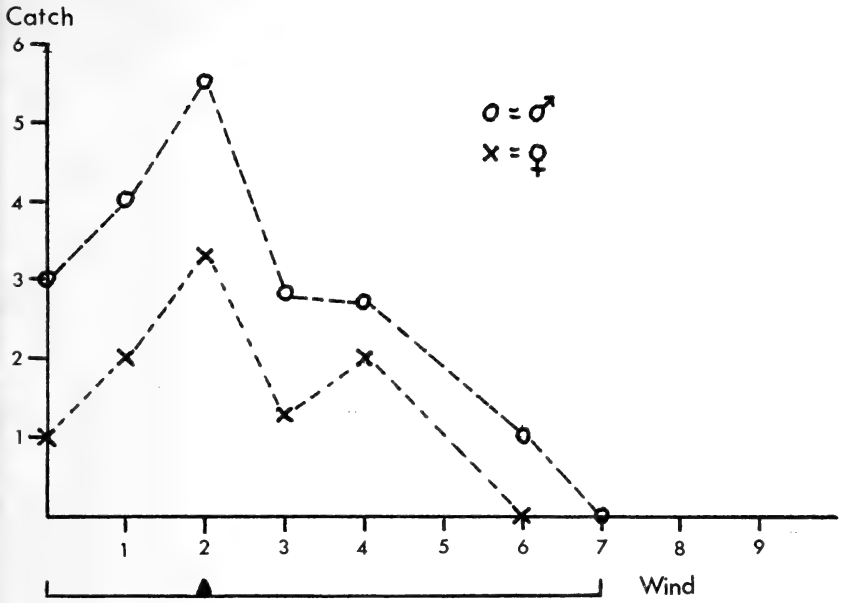

Fig. 6. The flight activity of *O. stabilis* in relation to wind force. (range for males shown below graph—compare with *fig.* 7.).

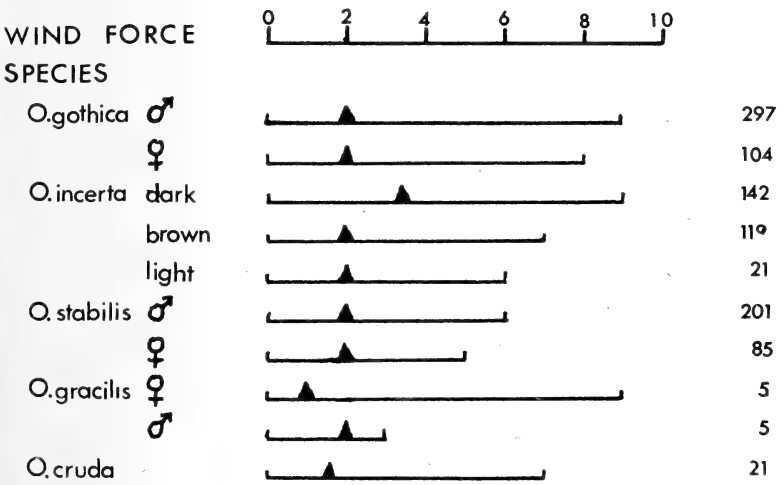

Fig. 7. Wind force relationships of the genus *Orthosia.*

N.B. *Fig.* 5 see overleaf.

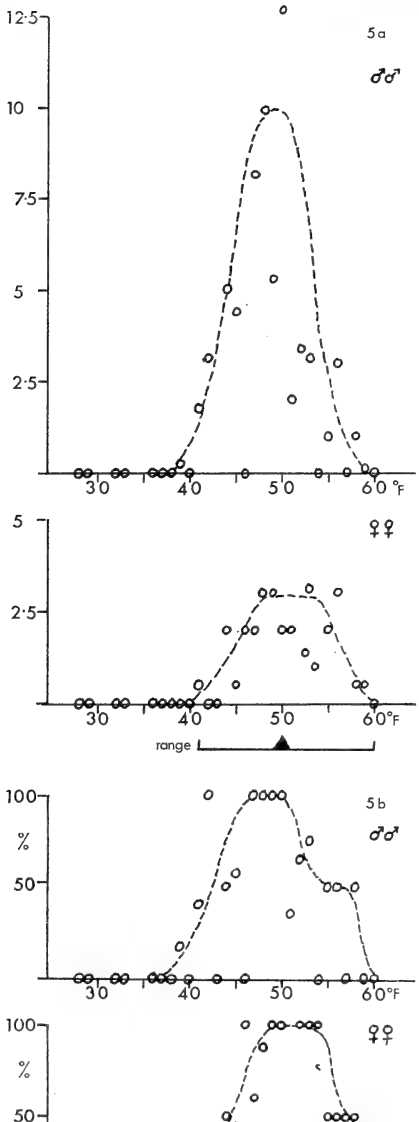

Fig. 5. The flight activity of *O. gothica* related to air temperature. (a) Mean catch plotted against temperature. (b) Percentage response plotted against temperature.

out the season (fig. 3) and was found to reach its peak definitely before the other two. Although colour followed a light to dark sequence it could not be proved that the two later forms had separate peaks.

In conclusion the six species of *Orthosia* show a great similarity in their range of responses to temperature and wind. These responses have been shown to differ slightly in the two sexes, females preferring warmer and less windy conditions. The early appearance of a light grey *O. incerta* cannot be explained yet and further work will be needed to solve this problem. A possible interesting line of approach would be to carry out simultaneously, an identical study of these insects at sallow blossom and compare this with samples obtained from the light trap.

J. S. Badmin (3406).

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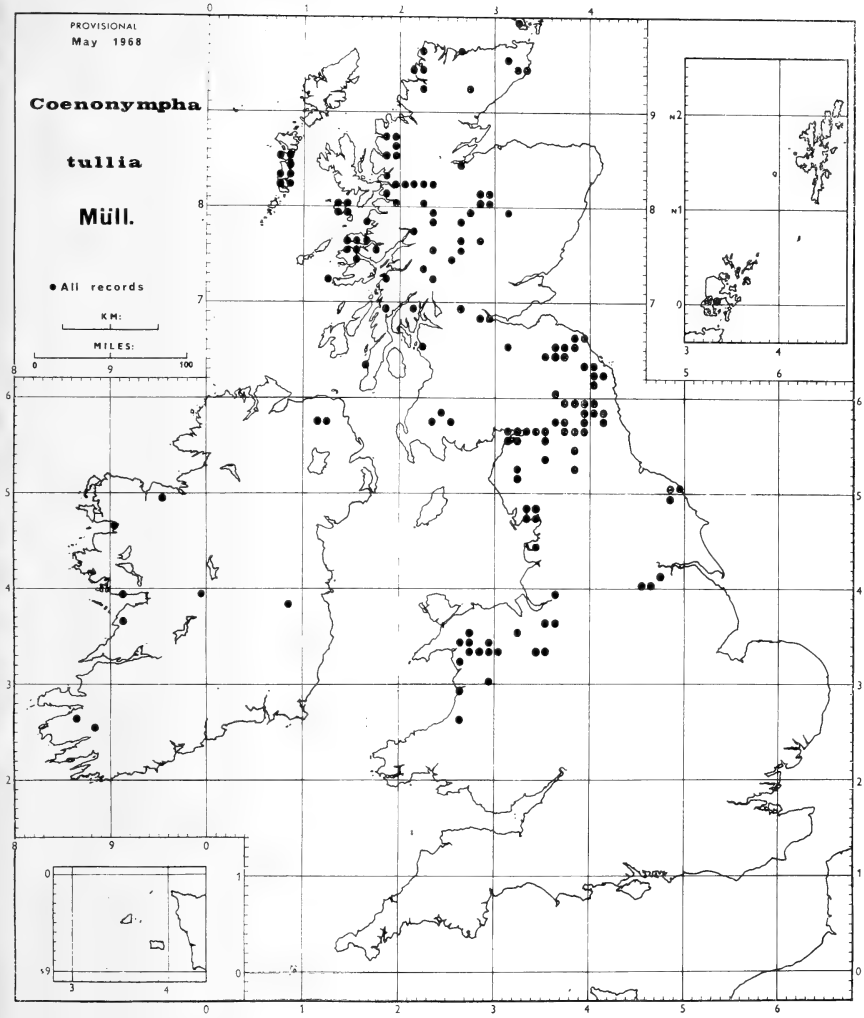
THE LEPIDOPTERA DISTRIBUTION MAPS SCHEME
Progress Report 1968

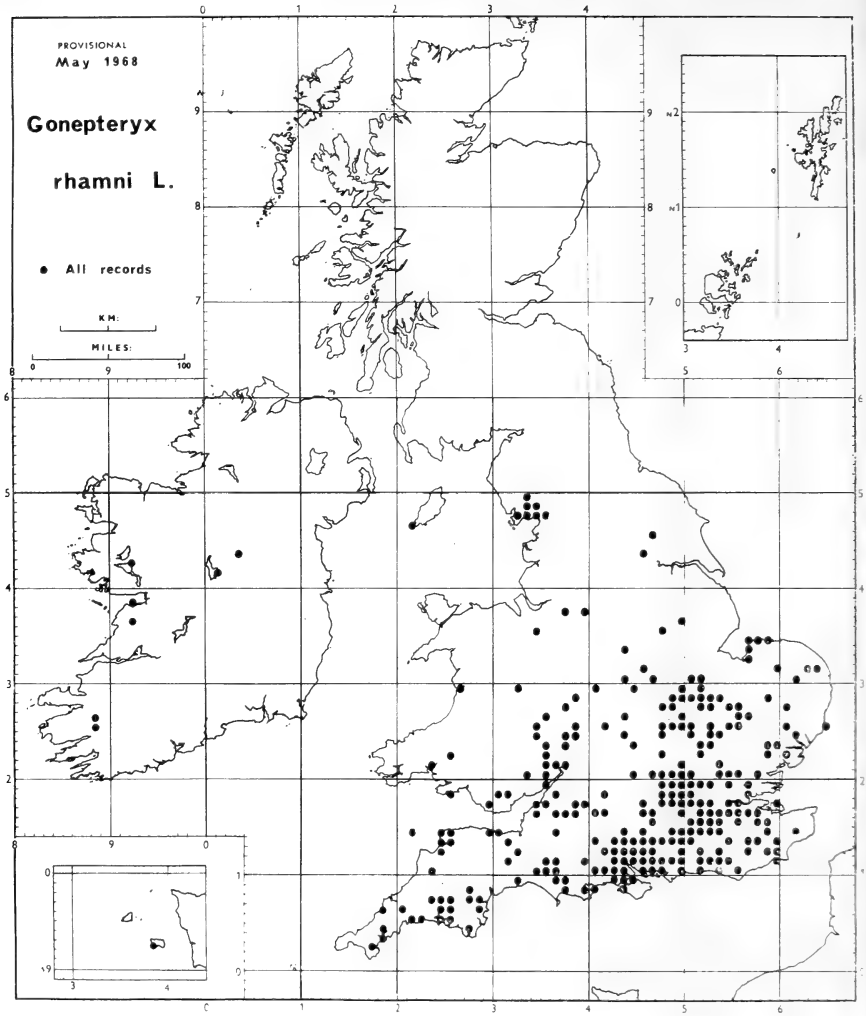
This scheme, the first of the insect distribution maps schemes, the object of which is to produce dot distribution maps of British Insects on a ten kilometre square basis, was announced at the Verrall supper held on February 21st 1967. Details of this project have been widely publicised and as a result some 730 lepidopterists have been enrolled as recorders. During the past twelve months 2600 field cards and approximately 10,000 individual record cards have been returned by 310 participants.

This magnificent response has made possible the production of the first provisional maps, copies of which have been sent to the participants



Large Heath

with a newsletter distributed in May 1968. Four of these maps are reproduced here. It should be emphasised that they are not considered to be complete and are published to show the style and format which will be used. They only include a very few records from the literature and no date discrimination has been made. This will be done using different symbols, on subsequent editions of the maps. A map showing the ten km. squares from which records have been received is included to give more meaning to the distribution maps. As the scheme progresses maps showing the number of records received from each ten km. square

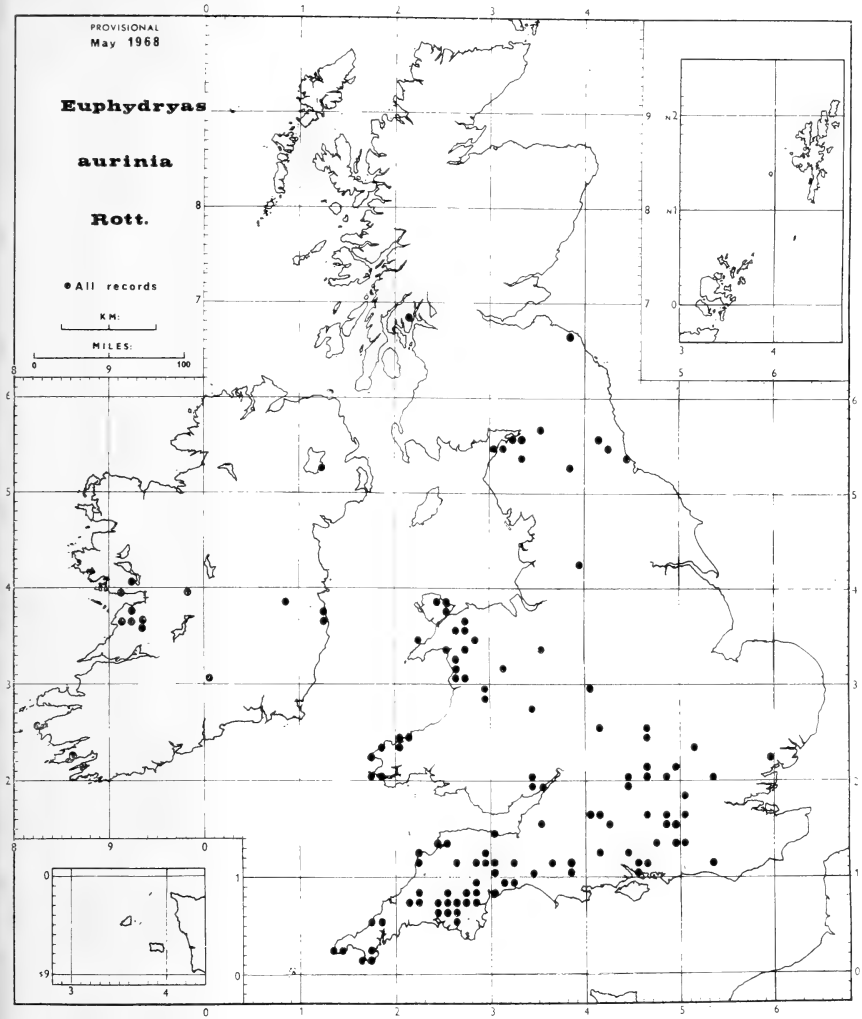


Brimstone

will be prepared. From these maps it is possible to determine whether or not absence of records on the distribution maps is due to absence of species or absence of data. Gaps due to lack of records are clearly shown on the map of *Gonepteryx rhamni*.

A panel of experts has been set up to deal with the identification of the difficult species and the first drawings for the figures to illustrate the Keys to these species are in preparation. They will be published as they become available, and it is hoped that the first will be issued later this year.

The network of county referees is now fairly complete and it is expected that the master cards will be ready



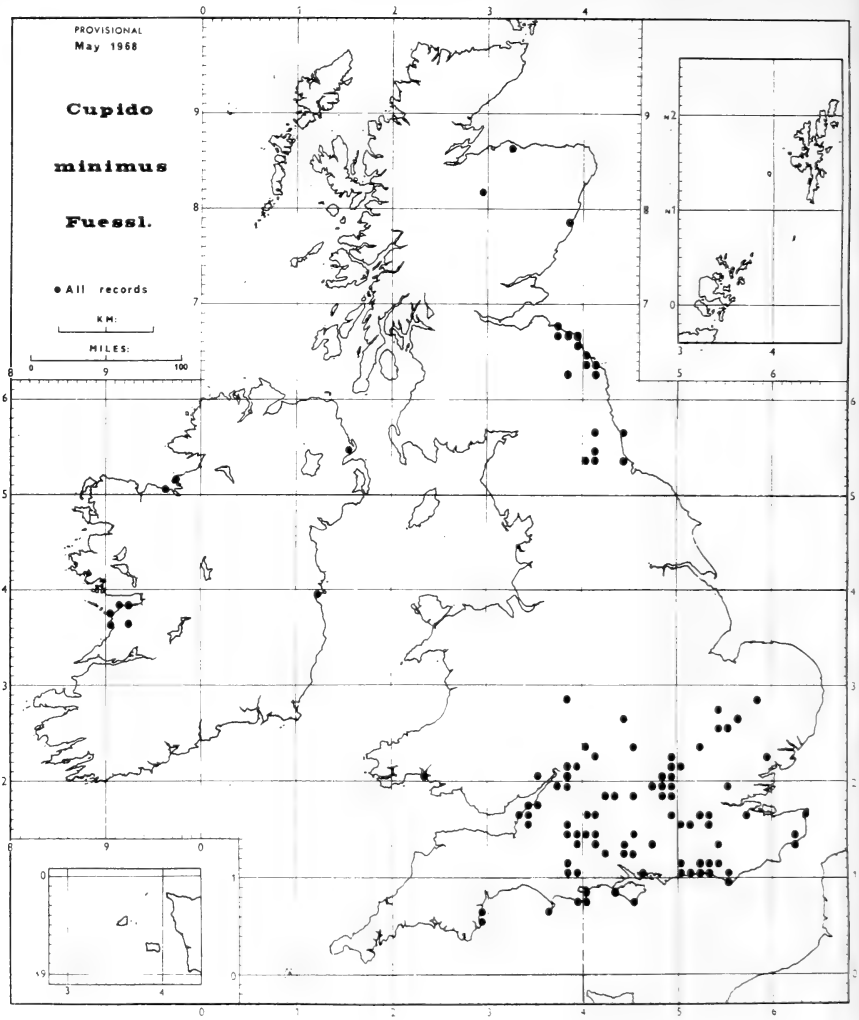
Marsh Fritillary

for photocopying to them this winter. Their comments on the records will provide the first check on validity.

Records have been promised from 1100 of the 3600 ten km. squares in the British Isles and to complete the cover more recorders are needed. Full details of the scheme, record cards and instructions are available from the Biological Records Centre at the address below.

Odonata Distribution Maps Scheme

A similarly organised scheme to



Small Blue

map the distribution of dragonflies was announced at this year's Verrall supper held on February 20th 1968. To date there are 50 participants in this scheme, details of which are available as below:

J. Heath,
The Nature Conservancy,
Biological Records Centre,
Monk's Wood Experimental Stn.,
Abbots Ripton,
Huntingdon.

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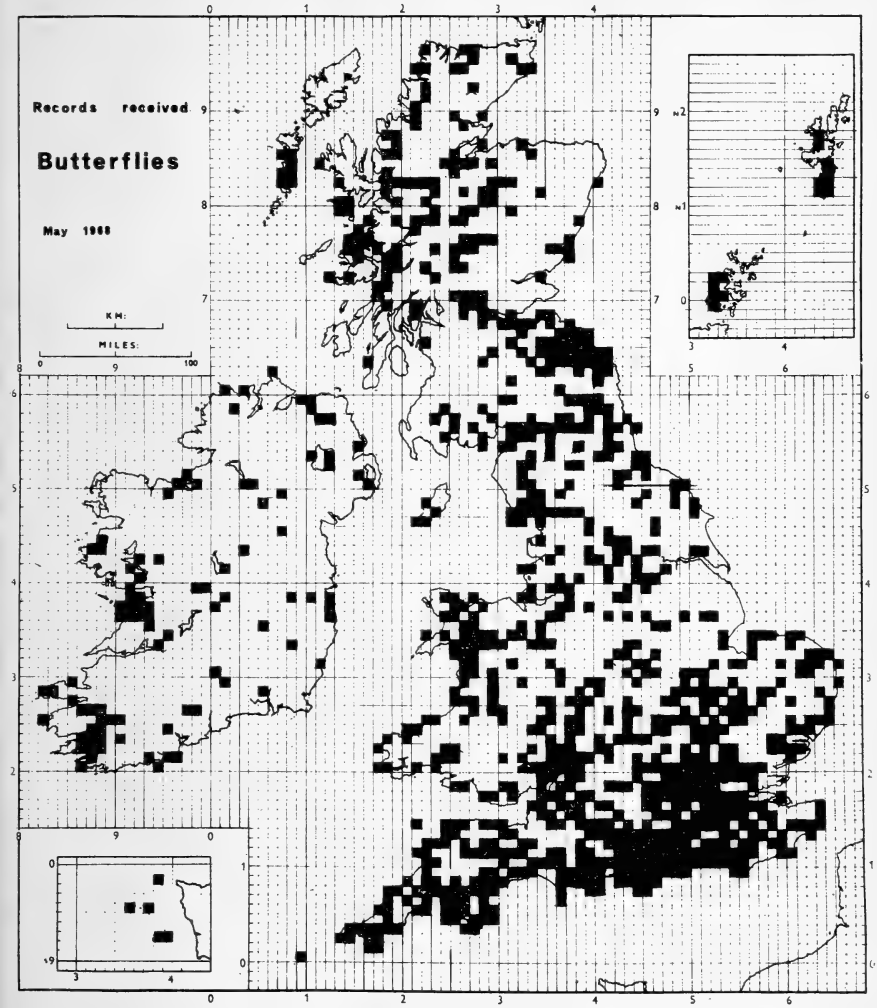

NOTES FROM A FINNISH DIARY (III)

(April-September, 1967)

In the two articles on Finnish butterflies published material was used to present an overall picture of the distribution of butterflies in Finland. Inevitably certain changes must be made in the facts presented, but these will be given in a short supplementary article at a later date. In order to bring future articles into line with others in the *Bulletin*, Cribb's system of nomenclature

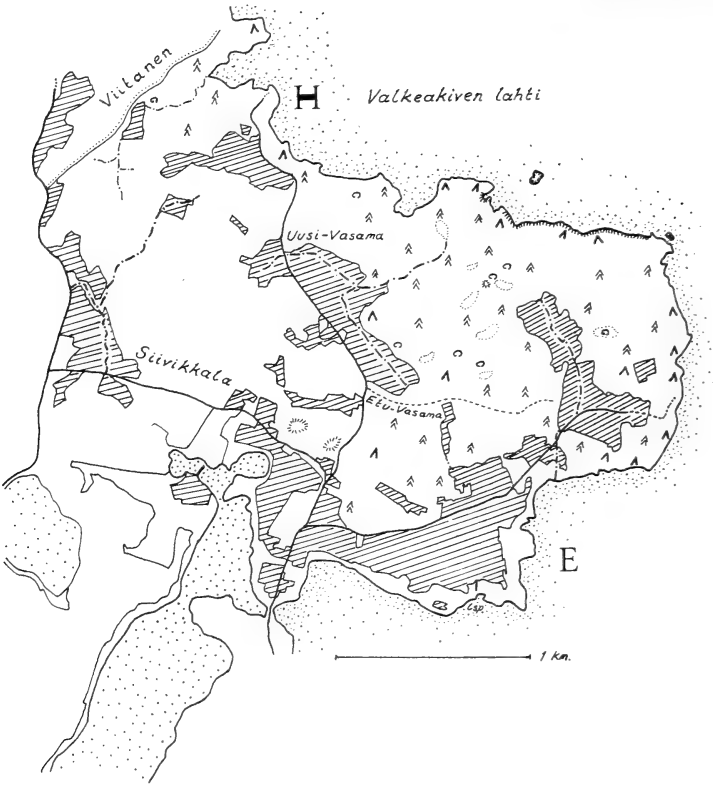

Fig. 1. Map of study areas E and H.

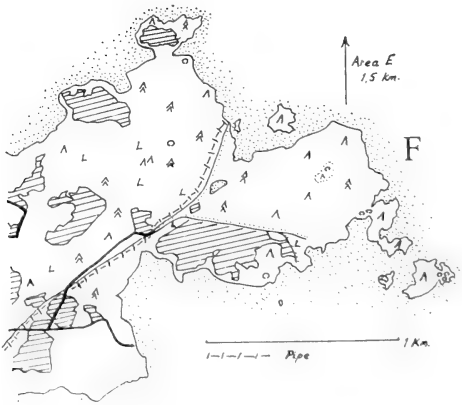

Fig. 2. Map of study area F.

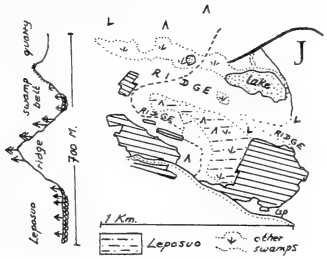

Fig. 3. Map of study area J.

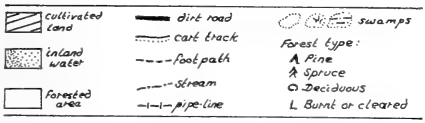

Fig. 4. Key to maps 1-3.

966) will now be adopted. The anges are largely at the generic vel, and it has now been confirmed / Gronblom (Tampere) that the riginal *Aricia agestis* Schiff. is, in ct, *A. allous* G.-H.

Owing to the malfunctioning of my ar I was forced, until the beginning f July, to choose areas within walking istance of my home at Lielahti, a llage some eight kilometres from ampere. Repeated visits to the me areas resulted in a knowledge eing acquired of the selection of abitats by imagines over a very small ea of South-Hame. Trips were also ade to Lapland (June 26th-July 10th) nd to Kuusamo (July 28th-August th), neither of which produced uch of interest.

Weather. Briefly, the warm, sunny eather which brought an early pring (April instead of May) con-nued throughout May, June and ly. It was, so I am told, a summer of are brilliance, and on occasions the emperature rose up beyond +25 °C. he temperature range in Hame during 1967 was thus about 65 Centigrade degrees.

Earliest records. April 12th: *A. urticae* Linn., and *G. rhamni* Linn. April 27th: *N. antiopa* Linn. April 29th: *Salix caprea* Linn. in full bloom (night visit for moths proved negative). April 30th: *Eupithecia lanceolata* Hb. (Geometridae) and *Lycia hirtaria* Cl. (Geometridae). May 6th: *Brephos parthenias* Linn. (Geometridae). May 13th: *Callophrys rubi* Linn.

Areas of Study. Areas A, B, C are discussed in Notes II (*Bull. amat. Ent. Soc.* **27:** 64-8). Area D. 8 km. from Tampere: this is the pine swamp mentioned in Notes II. It was very rich in Lepidoptera and yielded the moths, *Parasemia plantaginis* Linn. and *Diacrisia sannio* Linn. (Arctiidae) in addition to several of the 'swamp' butterflies. It has now been decimated to make way for a new railway line bordering the main road to Vaasa.

Area E. 11 km. from Tampere: the main area of study was north of the foot-path from Etu-Visama (see map E). Excluding all but the margins of

Table 1: Numbers of individuals recorded—1967.

Species	*April* 27	*May* 13	21	22	28	*June* 1	3	4	6	7	11	14	15	17	23	25	*July* 7	12
N. antiopa	B1																	
C. rubi		E6	F35		F60	F100		F100	F30	G20	H	F15	E15	E		K5		
A. urticae			F1		B1				E1									
L. argiolus			F2		F2				F1			F2						
G. rhamni			F1						F2									
P. rapae				B1														
L. sinapis					F10	F20	E5		F15	G3	H	F10	E7	E			F5	
A. cardamines						F5			F2				E1					
D. petropolitana						F2	E5		F7	G3	H	F5	E10	E				
C. euphrosyne					(F1)		E2			E7			E15	E			F6	
P. aegeria							E1						E5					
P. malvae							E7		F7	E3		F2						
P. napi							E3		F15		H		E10	E				
I. lathonia						F?			F1									
E. embla													E4	E1				
C. silvius																K1		
C. pamphilus																K4	F5	H2

	July 7	9	11	12	16	17	20	*August* 13-20	26
A. allous	F15		D5						
E. chiron	F15		d2						
C. semiargus	F15		D5	H5					
			d5						
L. amandus	F10	F2	D7	H10					
O. venata	F1			H1					
P. machaon	F1								
C. selene	F10	F2		I2					
				H15					
P. hippothoe			D7	H5					
B. arsilache			D50			J20			
Plebejus-Lycaeides -Vacciniina									
A. hyperanthus			d7	H15					
D. maera				H5					
				I2		J5			
P. icarus				H1					
H. virgaureae				H5					
A. lineola				I1		J5			
E. ligea					E1	J2			
F. niobe						J7			
B. ino						J5			
C. palaeno						J7			
C. tullia						J2			
P. brassicae							N1	M7	
G. rhamni						J1			
N. antiopa									L1

Area D:
D=swamp
d=mixed copse

the arable land, this area is mainly forested. The dominant tree is spruce (*Picea* sp.), but notice the predominance of pine (*Pinus sylvestris* Linn.) along the lake-shore. The few small swamps are dominated by stunted pine trees and are enclosed mainly by spruce forest.

Area F. 9 km. from Tampere: this is the "lantern-fly-shaped" peninsula immediately to the south of area E. The wilder part of it consists of spruce-dominant forest with *Vaccinium vitis-idaea* Linn., but there are also rocky outcrops with pine and *V. myrtillus* Linn. During hot weather the forest is cool and damp, whilst the rocky terrain is hot and dry. The area was especially rich in butterflies, largely owing to the presence of unkempt borders to the cultivated land, and to the pipe-line and the dirt road running roughly east, both of which have borders on to which the spruce has not been allowed to grow.

Area G. 11 km. from Tampere: a tract of sandy heathland, with stunted pine, *Erica* and *Calluna* species, extending between the crests of two steep, pine forested ridges. It was visited once (June 7th), when the habitat was hot and very dry (c.f. the pine swamps, where the air almost always feels humid).

Area H. 13 km. from Tampere: the spruce forest between E and H yielded few butterflies. The north-east running cart-track, bordered by deciduous shrubs and lush herbage

Table 2: Observed distribution (imagines).

Habitats:—	1	2	3	4	5	6	7
P. napi	FHN	EF					
O. venata	FH						
A. urticae	BF						
P. hippothoe	DH						
C. semiargus	FH						
L. amandus	FH						
C. silvius	K						
P. brassicae	MN						
P. rapae	B						
A. cardamines	F	E					
I. lathonia	F						
A. hyperanthus	H	d					
H. virgaureae	H						
A. allous	F	d					
E. chiron	F	d					
P. icarus	H						
C. pamphilus	F						
C. selene	FH	FHI					
L. sinapis	FH	EF	F		G		
D. petropolitana	FH	EF	F		G		
C. euphrosyne	F	EF		E			
P. malvae	F	E					
C. rubi		EF	EFH		G	EF	
E. ligea			EJ				
P. aegeria			E				
L. argiolus	N		F				
E. embla				E			
B. siphanica				DJ			
C. palaeno				J			
C. tullia				J			
B. ino				J			
F. niobe					J		
A. lineola					IJ		
D. maera	H			J	IJ		
'Plebejid' group				Dd	IJ	E	
N. antiopa							BL
G. rhamni							FJ
P. machaon							F

HABITATS

1. Cultivated land and road verges.
2. Open spruce glades.
3. 'Closed' spruce forest.
4. Pine swamps.
5. Sandy *Calluna* heathlands.
6. *Pinus-Vaccinium* heathlands.
7. 'Vagrant' species.

was extremely productive, as were small unkempt corners of cultivated land to the south-west.

Area I. 17 km. from Tampere: a sand quarry and its associated Spruce-*Vaccinium* heathland.

Area J. 13 km. from Tampere: principally a half-open, half-pine-dominated swamp known as Leposuo. There are also a few smaller bogs, a high sandy ridge (with spruce and pine cover) and a tract of sandy heathland with a mixed flora. The area is situated about one and a half kilometres from the nearest main road.

Area K. 85 km. from Tampere: the habitat, situated north-west of Ruovesi (62°N. 24°E.), was the unkempt enclosure of a wood-built summer-house. It rained frequently while we were there at mid-summer.

Area L. 32 km. from Tampere. Saarijarvi: lake and swamp country

Table 3: Flowering herbs noted at corner of field in Area F on July 7th.
Trifolium repens Linn. (white)
Galium mollugo Linn. (white)
Stellaria graminea Linn. (white)
Fragaria vesca Linn. (white)
Achillea millefolium Linn. (white)
Chrysanthemum leucanthemum Linn. (white and yellow)
Lathyrus pratensis Linn. (yellow)
Hypericum maculatum Cr. (yellow)
Geranium sylvaticum Linn. (purple)
Vicia cracca Linn. (purple)
Trifolium medium Linn. (pink)
Chamaenerium angustifolium (Linn.) Scop. (pink)
Veronica chamaedrys Linn. (blue)

with pine forest.

Area M: a garden on the western side of Tampere just off the Pyynikki ridge. August only.

Area N. 8 km. from Tampere: the garden at Lielahti, situated in the village between Areas E and F.

Methods. Few specimens of any species were collected (average three). Those that were collected have been provided with a pair of data labels. Examples are: (i) Suomi-Finland: 61°30′ N. 23°45′ E. : 11.7.1967: L. Plester, and (ii) Tampere: 6824-481 (map ref., kilometre square): Pine-bog.

A rough estimate of the number of specimens observed was made each day before leaving the field. These numbers appear in Table 1. This system dispenses with the inaccurate "common — quite common — fairly abundant" categorisation, but there are, of course, many sound arguments against its efficacy as an *actual* indicator of the size of imaginal populations. As to how far its results reflect comparative numbers I have at this stage no means of knowing.

Early stages. A later account will deal with the breeding of *C. rubi* (from wild collected ova) and *P. hippothoe* (from wild collected larvae). On June 6th a small, spindly bush of the *Rhamnus* genus was examined. It was growing in an isolated position in a clearing of Pine-spruce heathland (Area F), and had twenty-eight leaves. Three *G. rhamni* ova were discovered on one leaf (one orange, two white eggs) and as the one ovum hatched three days before the others, it probably came from a different female. No further bushes were discovered, despite a diligent search, and the clearing was gloomy and well-screened by saplings and mature trees. *A. urticae* larvae were found feeding on *Urtica* sp. in a birch copse in Area F. *L. sinapis* females were commonly observed ovipositing on *Lathyrus pratensis* Linn. in small glades in spruce forest (Area F). Individual larvae of *C. euphrosyne* (May 28th: F) and *C. selene* (June 11th: H) were found feeding on *Viola canina* Linn. A single pupa of *B. ino* was collected by a young friend from beneath a window-ledge of the summer-house in Area K.

Distribution. After examination of field notes, six main habitats were recognised. Table 2 presents a summary of the observed preferences of the imagines for particular habitats. Because of the small number of samples counted and of the short duration of the project, it is obviously impossible to draw any definite conclusions. There are, however, certain "pointers," some of which will now be considered.

Conclusions. The first three habitat types (left to right) in the columns of Table 2 tend to adjoin each other. One would expect, therefore, to discover that there are species which are commonly found on the wing in two, or even three, of them: this, in fact shows up in the table, in the second horizontal column, for example. Heathland types and swamps, on the other hand, are often isolated (e.g. vegetatively) from their surroundings. This is particularly true of the pine swamps, the typical species of which (e.g. *E. embla, C. palaeno, B. arsilache*) are not often found far beyond the natural limits of their

habitat. A second group of swamp-inhabiting butterflies (e.g. *C. euphrosyne*, *V. optilete*, *P. argus*) is not so restricted. Species of this group tend to have a distribution theoretically continuous throughout swamp, forest and heathland habitats where an alternative foodplant grows in sufficient abundance to support breeding populations and where other factors are favourable to their existence.

With *G. rhamni* a slightly different set of factors seems to be in control. Firstly, the foodplant (*Frangula alnus* Mill and *Rhamnus carthartica* Linn.) tends to grow in small pockets in a variety of situations in which only a damp, humic substratum appears to be a common factor (there is a grove at the lake edge in Area H, several bushes along the Viitanen cart track, and an isolated bush in Area F, mentioned under "Early stages"). *G. rhamni* is a proven vagrant, a habit possibly correlated with this 'unreliable' distribution of its foodplant. It also hibernates as an adult, though under what circumstances in Finland I do not yet know (Ivy does not grow wild here). These two habits are probably sufficient to account for its being met with largely as isolated individuals. When, and under what circumstances, does pairing take place?

Again on the subject of pine swamps, it is interesting to note that (after Seppanen and Gullander) *Vaccinium uliginosum* Linn. is a commonly-chosen foodplant (*C. palaeno*, *V. optilete*, *P. argus*, *L. idas*, *P. eunomia*, *C. euphrosyne*, *C. freija:* in the north also *E. iduna*). It grows in swamps in the south, and no certain heathlands in the north, and is found throughout the country. It is a small bush with soft green leaves and pendant pink flowers: there is the facies of *V. myrtillus* or *V. vitis-idaea*, but *V. uliginosum* is usually much larger than either of these relatives.

In South-Hame spruce-dominant forests account for 30-40% of the total area of productive forest land, whilst pine-dominant forests amount to about 40-50% (Atlas of Finland). The maps show that in Areas E and F the percentage of spruce-dominant forest is, in fact, much higher than 40%. Climatic considerations aside, it could be predicted that the butterfly species which had adapted itself to the Spruce-Whortleberry/Bilberry (*Picea-Vaccinium vitis-idaea/V. myrtillus*) habitat would, in the absence of effective predator and parasite control, be present in the highest numbers. This is substantiated by the results obtained thus far. The numbers quoted for *C. rubi* are positively well below the actual population numbers, and it is hoped to demonstrate this during the spring of 1968. There does not appear to be an unusually high number of tits, warblers and other insectivorous birds in these areas and the foodplant (*V. myrtillus* according to most books; *V. vitis-idaea* according to my own observations in Area F on May 28th) grows so profusely that competition from a number of moth and beetle larvae is unlikely to exert any great control on *C. rubi* populations. Nothing is known at this stage about its parasites. On the other hand, four third-stage larvae of *P. hippothoe* collected from Area H on June 11th produced one hymenopterous parasite each, indicating that parasitic control is to be taken into account when examining populations of this species. Again, one male specimen of *L. argiolus* (collected Area F, May 21st) bears the marks of an attack by a bird.

Species which are adapted to 'gloomy' mature forest are very few: *P. aegeria* and *E. ligea*, which were found as isolated individuals (of a damp stream bank in Kuusamo, where seven *E. ligea* were counted in the course of a half-hour).

Finland has a vast number of very small farms, each consisting of a few

fields and a few score hectares of forest, from which, with the assistance of the State, the farmers eke out a meagre existence. Insecticides, which are costly, are not in frequent use on these small farms, and there is a tendency for small, cleared areas of forest to be left fallow in order to concentrate efforts on larger, more productive parts of the homestead. Such small, unkempt places in areas F and H support a large number of butterfly species. Most of these are typical wayside insects, but forests species such as *C. euphrosyne* and *C. selene* are frequent visitors. The prolificity of flowering herbs, as well as the comparatively high light intensity, is an attractive feature. On July 7th at the western edge of the field in Area F many plants were in flower (see Table 3). Butterflies which were observed on the wing in that place are listed under 'Cultivated land'. On the evening of July 7th seven of these species (*A. allous*, *E. chiron*, *C. semiargus*, *L. amandus*, *C. pamphilus*, *O. venata*, *C. selene*) as well as a number of different types of Geometrid moths were found resting on, or near, the flowers, indicating a well-represented 'indigenous' butterfly population.

Vagrancy. The term vagrant as used in Table 2 is applied to butterflies which when noted were obviously en route for some other place. The first specimen of *N. antiopa* was observed flying round a woodyard on the northern limit of Tampere. The indication is that it had hibernated in the immediate vicinity. The second specimen was flying high in the sort of country the Finns term "wilderness". Because of the necessity of seeking out favourable quarters for hibernation, *A. urticae* might also be suitably fitted into this category. Its case, however, differs from that of *G. rhamni* in that, once it has redispersed after hibernation, it exhibits a marked tendency to associate itself for quite long periods with one particular area.

The 'Plebejid' butterflies. Difficulties were experienced at that time with identifying butterflies of the *Plebejus-Lycaeides-Vacciinina* type in the field. They have been included together in the tables for the sake of completeness, but nothing more will be said about them at this stage.

'Notes-IV' will contain further details of the life-history of *C. rubi*, and of breeding *P. hippothoe*.

Finally, I should like to express my thanks to Dr C. B. Williams for drawing my attention to Kaisila's paper; to the Baron de Worms for his interesting comments on the distribution articles; and to P. W. Cribb for his many helpful suggestions.

21.5.68. Leigh Plester (2968).

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SOUTHERN SWITZERLAND AND NORTH ITALY—1967

Continued from page 99.

Our next trip from Varzo was again up the Simplon road to the valley of the Laquintal just above the village of Gabi (just in Switzerland). This valley has a raging torrent in the bottom of the gorge and above, the slopes are partly cloaked by Spruce and long rivulets of stone streak down from the heights above towards the valley. Short grasses and a myriad of flowers grow under the trees and

beside the stone chutes and the whole area is alive with butterflies. This is a famous spot for the *Erebia* species and the only area in which *Erebia christi* Ratz. is known to live. Along the edge of the stream I took *Parnassius phoebus* Fab. and one *P. mnemosyne* and *P. apollo* was quite common. The commonest Erebia on the wing was *Erebia ceto* and there were also a few *E. euryale* Esp. and *E. melampus* Fuessl. along the slopes. Also quite common was a very fine form of *Maculinea arion*, very large and heavily suffused with black scaling. I took several *P. bryoniae* and the Fritillary, *Mellitaea diamina* Lang. Higher up the slope there ran a path leading up towards the glacier from which the stream sprang. This proved to be the most fruitful area and I captured my first *E. christi*. It is very like *E. epiphron* and *E. melampus* when on the wing and also is easily confused with *Erebia mnestra* Huebn. which was flying everywhere over the rocks. Every specimen had to be netted in order to make identity certain and I caught several hundred specimens to produce five males and two females of *E. christi*. It is obviously scarce although it has quite a large area in which it can fly and collecting is confined to the paths as the slopes are extremely steep. One of the reasons for its scarcity may be over-collection. That morning we met Messrs Bretherton and De Worms and five other collectors, German, Italian, French and Swiss—more lepidopterists in one morning than I have seen abroad in six sorties. *Erebia christi* was the quarry that had attracted them. The butterfly is very similar to *E. epiphron* which flies in this area and which is larger and better marked than *E. epiphron* taken at the top of the Simplon. This led to some confusion at first but once I had ascertained the characteristics of the two species I was able to pick them out quickly. Other Erebia species here were *E. triarius* de Prun. (almost over), *Erebia montanus* de Prun. (freshly emerged) and *E. tyndarus* Esp. also just emerging, as I only took males. Another exciting find here was *Colias palaeno* Linn. which I was able to photograph for the first time. The larvae feed on *Vaccinium* spp. There were several of the Skipper, *Spialia sertorius* Hffsgg., along the path and Uffen had an interesting morning working over a pile of cut logs which had both *Rhyssa* and *Urocerus* spp. emerging. That evening after we had returned to the Hotel, Uffen remained in the valley and had an eventful hour with the microlepidoptera which became active as the light began to go.

We spent one further day in the Laquintal and added the Blue, *Maculinea alcon* Schiff., to our score. This butterfly is very like the Large Blue in its life history as it is symbiotic with the Ants (*Myrmica* spp.) but its plant food consists of species of Gentians (*Gentiana*). I also took a male of this species on the top of the Simplon Pass flying with some of the high mountain Colias, *C. phicomone* Esp. On this visit we met two Swiss lepidopterists, one French and one Italian and again our friends Bretherton and De Worms who had been trying lower down in the Gorge near Gondo, with little success.

On one afternoon after returning from the Simplon, Uffen and I spent a few hours in the fields just below the village of Varzo, near to a railway embankment. Here it was parched and the sun very hot and the insects quite different from higher up the Pass. I took *F. adippe* Rott. (typical form), *C. euphrosyne* Linn., *H. alciphron* Rott., *C. croceus* Fourcr., *A. galathea* Linn. and the Skipper, *Heteropterus morpheus* Pall., a species which I had taken previously in the Landes, S. France. It has a very distinctive flight and we later found it in all the wooded areas of the lowlands

around Domodossola. I also found several of the Burnet-like moth, *Syntomis phegea* Linn., several in copula. Another find was a small species of the Ant Lion *Myrmeleon* sp. and a full fed larva of the Pale Tussock, *Dasychira pudibunda* Linn. One further outing in the Simplon area finished up in the valley above the village of Simplon Dorf. This was quite a delightful spot with a racing brook running through meadows of cotton-grass and alpine flowers with rocks and boulders liberally strewn about. Some new species were found here—the mountain Fritillary *Boloria pales* Schiff., the high mountain Blue, *Agriades glandon* de Prun., and *Aricia allous* G.H. I was also pleased to capture a further specimen of *Erebia christi* Ratz. being some distance from the other locality where we had found it. This is a vast area for collecting and we had only time to sample the road fringes and the small valleys near to the paths. One could spend weeks here and still leave much ground untouched. Beetles were quite plentiful and I was able to collect several tubes full for my father. These were later shown at the Annual Exhibition.

With the continuing hot weather we now turned our attention to the lowlands below the Simplon Pass and beyond Domodossola. The towns in the area are not very large and between them and along all the roadsides lie meadows thick with flowers. These meadows are cut for fodder but at this time of the year cutting had only just started and the meadows were alive with butterflies. The river running down the valley is called the Toce and this opens out into a very large river beyond the town of Vogogna. Near this town we made our first stop by a roadside stoneyard where they were cutting granite slabs taken from the mountainside above the valley. The morning sun was already very hot and the meadows were thick with a tall umbelliferous plant which was the target of most of the butterflies on the wing. The S Iver-washed Fritillary, *Argynnis paphia* Linn. was everywhere, freshly emerged. The males were typical but all the females were of the form *valesina* Esp. I captured some of these alive and was able to get them home alive to lay eggs in a cage in my garden. A great thrill was to take the White Admiral like butterfly, *Neptis rivularis* Scop. (*lucilla* Schiff.). This flies just like *Limentis camilla* Linn. and as both species were on the wing several hectic chases resulted in a capture of the latter. A surprising find was the second brood of the Duke of Burgundy Fritillary, *Nemeobius lucina* Linn. They were all males and very fresh—we found them later on near Lake Orta much farther south. Another new species was *Scolitantides orion* Pall., a pretty Blue which haunted one corner of the meadow where its food plant was growing (*Sedum* sp.). *H. morpheus* was quite common on the edge of the wooded slope and also there were a few *Hipparchia fagi* Scop., *Minois dryas* Scop. *Aphantopus hyperantus* Linn. An interesting moth capture was the Scarlet Tiger, *Panaxia dominula* Linn., flying in the meadow in the bright sun. We spent two mornings in these meadows and then made a further trip on to Lake Orta. This is a much smaller lake than Maggiore and has a delightful little island crammed with buildings. Coleridge had stayed here on an earlier visit to Italy and we stopped on the roadway above the Lake to take photographs. The whole area leading to the lake and surrounding it is heavily wooded and we drove through densely wooded valleys and climbed up winding roads edged with Sweet Chestnut, Oak and Ash to stop by the roadside for a meal in a small clearing in the all pervading forest. Again the Skipper *H. morpheus*

was flying in the clearing and a few Duke of Burgundy Fritillaries—a thrill was to find the wild Gladiolus growing near a small brook which ran across the clearing. The Dark Green Fritillaries here were very large and heavily marked on the underside with silver and the High Brown Fritillaries included a high percentage of the form '*cleodoxa*'. We saw three more *N. rivularis* flying along the roadside and managed to net two. The larvae feed on *Spiraea* sp. which was growing in clumps here and there in the clearings. I watched two freshly emerged Brimstones, *Gonepteryx rhamni* Linn., in a courting flight with the male eventually copulating—confirming that in this southern region the butterfly is almost certainly double brooded. We came back via Omegna and stopped again in the flowery meadows near Vogogna where I netted a damaged female Camberwell Beauty, *Vanessa antiopa* Linn. As it was otherwise fresh I kept it alive and brought it back to England with me but it died without laying. Dissection showed the eggs to be only slightly developed so it must have been a newly emerged specimen which had been damaged soon after emergence. A surprise here was to find the Small Pearl Bordered Fritillary, (*C. selene*), freshly emerged and in numbers—this must be near its southern limit. I also caught two very brightly coloured specimens of the Copper, *Heodes tityrus* Poda, (both females). They contrast dramatically with the females of the subspecies *subalpina* Speyer which we had taken on the Simplon. These meadows were so full of insect life that the time was again too short to take in all that was there. The trees were buzzing with Cicadas and I saw a large snake curled up by some rocks but it was too quickly away to identify. On the cliffs above the valley we spotted a pair of eagles wheeling and calling to a young eagle perched on the top of a tall pine. They tried to land beside it but the combined weight tipped the tree and all three sailed out over the valley, filling the air with their cries. Everywhere in the area bird life is very sparse—we did have a family of Red-backed Shrikes in the grounds of the hotel at Varzo—the parents used a flag pole as a vantage point to swoop on insects as they flew across the meadow.

Another trip down the valley of the Toce lead us onto a road running parallel with the main roadway but on the other side of the river. Here we found the meadows were more heavily grazed and cut and the flowers much reduced. The uncultivated areas were very rocky and with the sun unclouded the heat was oppressive and collecting was tiring. We found a coppice of False Acacia (*Robinia pseudacacia* Linn.) beside a rocky stream bed which cut across the road—the stream was dry and led down to the wide rolling flood of the Toce. In the coppice a female Golden Oriole was calling—a plaintive and monotonous sound. It was so hot that the butterflies seemed to have taken a siesta but when I walked down the dry gulley to the river I found them all—sitting in groups sipping the moisture on a sand-bar jutting out into the stream—Skippers and Blues, Satyrs and suddenly a flash of purple—a male Southern Purple Emperor, *Apatura ilia* Schiff. It settled and I was able to stalk it successfully—it was of the brownish form *clytie* Schiff. I have seen similar congregations of butterflies at Digne at the time when the sun is hottest—dehydration is obviously a problem for many species and the stream with its sand banks or mud flats becomes a ready answer.

Our trip was now coming to an end and on the last day we again drove down through Domodossala,

not daring the high pass again which we had taken on our first journey to Varzo, and skirted the Lake Maggiori, with its villas and holiday villages, through the frontier Customs back into Switzerland and to Biasca and the train. Our train journey back was uneventful but we were able to enjoy the majesty of the mountain scenery and the great lakes in the evening light despite a storm above the St. Gothard and squalls of rain at Interlaken. We had had an excellent fortnight in all respects—weather, insects and company.

1.3.1968. P. W. Cribb (2270).

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A CAGE FOR OVERWINTERING PUPAE

A cage for overwintering pupae or for keeping larvae can be improvised from the one lb. plastic containers in which Canadian honey is sold in Supermarkets.

The central portion is removed from the lid, leaving little more than the rim. Small holes are cut in the bottom of the container for drainage (in the case of outdoor storage) and it is a good idea to cover the bottom of the container with a layer of coarse sand.

A piece of netting (e.g. nylon chiffon) is held over the top of the container, and the lid, prepared as above, is clipped on over the netting. This puts a slight tension on the netting, and holds it firmly in place.

A hot piece of thick copper wire is a useful tool for cutting the lid and piercing the drainage holes. Alternatively, the lid can easily be cut as required with scissors.

The resulting container is hygenic and easily cleaned. It will stand any weather and is proof against birds. It costs practically nothing and will last a long time. In the case of emerging microlepidoptera, a piece of glass can be substituted for the lid and netting.

James Heal.

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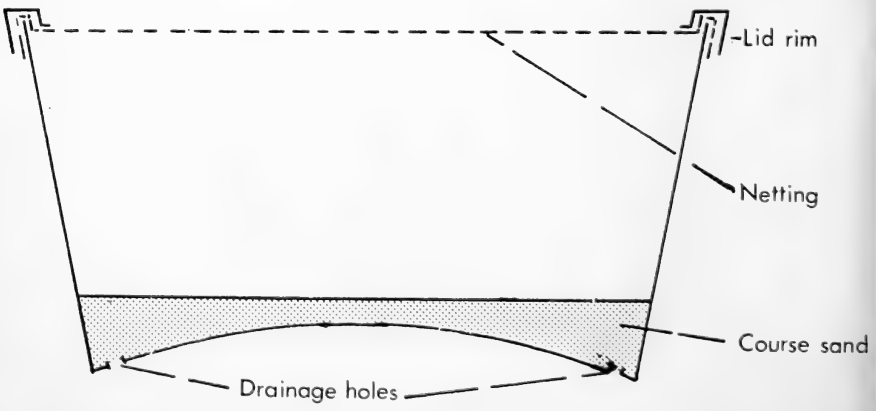
NOTES ON THE COMMA IN BASILDON

The following observations may be of interest to members. On the 15th April 1968, on some waste scrubland near my house, I saw two Commas (*Polygonia c-album* Linn.). As far as I know these are the first to be seen in Basildon although I saw one on the



outskirts of Basildon in 1966. Based on the information in Stokoe I have worked out that since 1924, when this species was confined to Worcestershire and neighbouring counties, the Comma has extended its range at an average rate of three and a quarter miles each year.

I caught one of the Commas (a female) and a few days later caught two more females. They all laid eggs but only the eggs from one of the females hatched. These ova hatched out on April 27th to May 2nd. By May 25th nearly all the larvae had changed their last skin. This last skin, incidentally, is one of the prettiest butterfly ones, other than the Swallowtail, I have seen.

The first larva changed to a pupa on May 31st. This emerged as a var. *hutchinsoni* butterfly. From then on four more of this variety hatched out during the next two days out of a whole batch of twenty pupae.

Finally the second brood ova laid by these butterflies have not hatched out yet but seem to be infertile.

26.7.68. G. Wragg (4196J).

REFERENCE

STOKOE, W. J. ed. (no date). *The Observers book of British Butterflies*. Warne, London.

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SCALE INSECTS IN SOUTHERN ENGLAND

A new species of scale insect, belonging to the genus *Pulvinaria*, has been discovered on trees in Southern England, infesting especially the Horse Chestnut (*Aesculus hippcastanum* Linn.) but also the Elm (*Ulmus*), Ivy (*Hedera helix* Linn.) Holly (*Ilex aquifolium* Linn.) and Hawthorn (*Crataegus*). Particularly heavy infestations have been noticed on Horse Chestnut trees in the suburbs of London. The scale insect was first noticed at Pesthouse Common, (near Richmond Park, Surrey), and along Kew Road adjoining Kew Gardens. The species is a member of the order Hemiptera and belongs to the suborder Homoptera. A member of the family Coccidae, it has only been discovered so far in the female sex, which indicates the probability of a parthenogenetic life cycle, that is to say, the virgin females are capable of laying fertile eggs which always result in females. In this system males are never produced naturally. The females can be seen resting on the small branches of trees as small oval scales. The insects have sucking mouth parts, characteristic of the Hemiptera, and they are embedded into the bark of the tree, whence the insect sucks out the sap. Consequently, in large enough numbers, the insect becomes a great threat to a tree and presumably would eventually kill it.

The insect's life cycle can be divided into three parts. In the first and second stages the legs of *Pulvinaria* differ—the length and shape of the joints varying. In the third or adult stage the females produce white ovisacs underneath the scale, and it is thought, although not confirmed, that the ovisacs' eggs are dispersed by the wind. The white ovisacs are fluffy in appearance and immediately they are produced, the presence of the insect is obvious, even to the casual eye. It is not yet known precisely when each stage starts and finishes, but as a rough guide second stage insects are found in March and April and sometimes adults are abroad in late March.

At present Holly is thought to be a secondary host, and perhaps Elm as well. (Adult insects were found on Holly at the end of March at Pesthouse Common). Other localities where there are confirmed outbreaks are Syon Park in Isleworth, Middlesex (on the doorstep of the Gardening Centre), at Osterley Park and along the Great West Road near

London Airport. As these localities were taken at random and visited especially, and outbreaks were found in each case it tends to show that the infestation is much more widespread than was at first thought. Several theories have been put forward to explain the origin and spread of the infections but all are just suggestions and have no proof. It seems that this topic would provide much room for research into the way the insect established itself in the first place, and how it spreads. Is it brought here by aircraft via London Airport, or by road? Is it possible that the infestation is spread by wind or perhaps by the traffic which streams past the trees? Many of such questions can only be answered by actual field study of the insect in its natural surroundings, and much help is needed from all levels to map this insect, and, if necessary, exterminate it if it becomes a serious threat to our already fast disappearing trees.

P. W. Finbow (4261J).

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LETTERS TO THE EDITOR

Sir,

With reference to Mr Plester's note (*Bull. amat. Ent. Soc.*, **27:** 33-4) on the sensitivity of 'gnats' to sound.

I wrote a note on this subject in the Entomologists Monthly Magazine (*Ent. mon. Mag.* 1941, **77:** 96) observing how some swarms of small flies by a lakeside near St Paul, Minnesota, USA, jumped at certain sounds during the conversation of three or four observers—particularly a short cough. They also responded strongly to the shaking of a bunch of keys. But none of these sounds was continuous so the question of attraction did not occur.

My note was in reply to an earlier note in the same volume page 63, by J. A. Robinson—on the same subject in England.

1.3.68. C. B. Williams (*Hon.*).

Sir,

I have read with interest Mr B. A. Mason's contribution under the heading "Some Notes From Essex" in the *Bulletin* for May, 1968, but I am afraid that in the observation of the White Admiral Butterfly (*Limenitis camilla* Linn.) in Essex "fifteen miles from Aldgate Pump" he has not made entomological history! I believe that the species has long been established in the woodland to which he alludes and I encountered it almost annually in its proper season in the 'twenties and 'thirties, when I visited the area fairly frequently. Always, however, it was scarce and the observation of more than one or two individuals in a season was unusual. Incidentally, specimens from this Essex wood are approximately the same size as those from the New Forest which, in turn, appear to be fractionally smaller than those from West Sussex.

In Mr Mason's Essex woodland *Argynnis cydippe* Linn. appeared to have a parallel status and was equally scarce.

It is nice to know that the White Admiral is still there and I wonder whether Mr Mason has encountered the Fritillary?

29.6.68. Gresham R. Sutton (237).

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JUNIOR NEWS SECTION

I am sure you realise that I am writing this in mid-summer when everybody is either just doing something entomologically or is just about to. I hope to put news of their adven-

tures and discoveries in the next issue.

I think I must have 'boobed' with the May quiz this year. When I sifted through the entries I found that only four people had managed to obtain high enough marks to be worthy of one of our token prizes. I must say that the attempts at drawing the specimens asked for were quite excellent. The questions about insects in general appear to have stumped most of you. I should be very hurt if I were a Thrips or a Damsel fly or a Cockroach or even an Aphid if I really thought that no-one cared enough to find out a little about me.

The four who did care were Elizabeth Fisher (4198J), Barbara Brant (3893J), Donald Firth (4199J) and Lance Chilton (4198J). Twelve year old Elizabeth of 3 The Drive, Wellingborough, Northants., asked for set specimens of the Buff Tip and Red Underwing Moths for her prize. I gather from a report she sent in that she takes her entomology very seriously. Elizabeth lives near Apsley Heath which, although it is mainly conifers, has provided her, on various expeditions, with some interesting specimens. On June 2nd she took the Many Plume Moth (*Orneodes hexadactyla* Linn.) and the Skipjack Beetle (*Athous haemorrhoidalis* Fab.). On June 9th the Long Horn Beetle (*Rhagium bifasciatum* Fab.) a northern species, turned up along with that fellow with the coat of many colours *Harpalus aeneus* Fab. the Bronze Harpalus (Ground Beetle). A beetle I have not seen for many years was actually caught with a net while on the wing, this was the fierce little tiger *Cicindella campestris* Linn.

On July 7th a formidable but quite harmless Greater Horntail Wasp (*Sirex gigas* Linn.) was caught along with a Golden Swift Moth (*Hepialus hecta* Linn.) and a White Border Moth (*Bupalus pinaria* Linn.).

Elizabeth also tells me that the pupa she found on April 28th emerged on May 12th as an Angle Shades Moth (*Phlogophora meticulosa* Linn.); while from mid-April her Indian Stick Insects (*Carausius morosus* Brunn.) began hatching and hatching and hatching.

There is a little Minor Moth (*Procus* sp.) fluttering outside my window just asking to have his name put down in my little book for Nature Conservancy records.

Barbara Brant lives at 40 Castlebar Park, Ealing, London, W.5., and being keen on the larger moths especially 'Hawks' requested some livestock of the Japanese Privet Hawk *Dolbina tancrei* for her prize.

I know that Barbara has been working on moths for the last two years at least, being both interested in rearing, and observing her favourite insects. During this year she has been breeding Lime Hawks, Poplar Hawks, Early Thorns, Vapourers, Gipsy and Muslin Moths and by early July they had all pupated with the exception of the Early Thorn. Her Privet Hawk laid a number of eggs and it is hoped that they all hatched out. Barbara says that on just one day, 6th July she saw the Comma, Small and Silver Spotted Skipper, Meadow Brown and various Whites all of course being Butterflies as well as a Latticed Heath Moth (*Chiasmia clathrata* Linn.) and the larvae of the Knot Grass Moth (*Apatele rumicis* Linn.). I do hope she keeps on enjoying her scientific hobby as she obviously does from her letters.

Donald Firth is 16 years old and lives at 22, Manor Way, Purley, Surrey, CR2.3BH. His prize was some Corsican Stick Insects (*Clonopsis gallica* Charp.) which arrived 'slap-bang' in the middle of his G.C.E. 'O' level examinations. He did find time to spare from his studies to build a light trap for the total cost of £4 10s. including wiring, a mercury vapour bulb and choke. The trap appeared

to work quite well as on the second night of running it caught an Eyed Hawk Moth, and from then he says it went from strength to strength. In one month he has taken eight Elephant Hawks, a Small Elephant Hawk (1st record for his area) six Poplar Hawks, six Privet Hawks, an Eyed Hawk and a Lime Hawk. In one week in the middle of July Donald was catching as many as 500 moths in each night, and even caught three Sparrows (birds) which made it necessary for him to make the trap hole smaller.

Donald is also very keen on rearing Moths and has managed to get all seven of the Elephant Hawk Moth caterpillars he found to pupate. He hopes to release the imagines (adults) next year. On the 19th July he had an Indian Moon Moth (*Actias selene* Huebn.) emerge with very strangely curved tails to its wings. He thinks that the specimen is quite large for this species being a male with a $6\frac{3}{4}$" wing span. A pairing between two different species of Silk Moths, a female *Antheraea pernyi* G.-M., and a male *Antheraea harti* Moore, resulted in 150 eggs which if they hatched out will have produced some interesting mules (not horses). Finally Donald was hoping to spend most of his summer holidays doing some form of natural history or other. He was to have spent the first week of August camping with the National Trust on Golden Cap, Lyme Regis where he expected to obtain many Garden Tiger Moth larvae, the rest of the Summer he was to have spent in Asiatic Turkey. I do hope he was not joking as I am sure we should all be looking forward to hearing about such a exciting expedition. Donald has a friend in France who is interested in natural history; do any of you correspond with naturalists in other countries?

Exciting expeditions do not remind me of school but while I am thinking about school I am reminded, by my son who is doing a project on Beetles in stored food products for his examinations, that I ought to offer you any help you might like in these kind of ordeals. Please do not hesitate to write if you think that I may be able to supply you with live insect etc. for projects. If I do not actually have the animals you want I might know someone who has.

"Some one" else reminds me that I must not dare to close the news section without mentioning the last of the May Quiz winners. He is Lance Chilton of 2 Castlefields Drive, Charlton Kings, Cheltenham, Glos., Lance asked for some Indian Stick insects for his prize and now has some Madagascan Sticks (*Sipyloidea sipylus* Brunn.) and some Corsican Sticks. He tells me that his Indian Sticks took a fancy to Willow Herb and Strawberries. I have heard that these insects can cause havoc in a greenhouse if they escape among the valuable plants housed therein. I have just checked my two pet tomato plants and found a big hole chewed out of one of the leaves. I wonder whether a stock of Indian Sticks can survive on plants other than Privet or Ivy. I'll just put back this ruffianly little Stick Insect back in its cage. Before I go I would like to say I do hope you *will have* enjoyed the Annual Exhibition, but more about that next time.

H. J. Berman F.R.E.S. (2491A).

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BOOK REVIEWS

Warnes Picture Reference Books by George E. Hyde. Pp. 48 Colour illustrations. Frederick Warne and

Co. Ltd., Price 5/- each.

There are at present four books in this new series but others are to be included later. The ones available at present are:

Butterflies, Moths and their Caterpillars.
Berries and Fruits.
Insects.
Wild Flowers of the Spring.

They are pocket sized and well illustrated with colour photographs by the author. He has also written a short account which accompanies each photograph. Scientific names are used together with common names throughout the books.

This series is intended for use by juniors, as an introduction to the subject. As such they are excellent value for five shillings each. The books will be of most value to very junior members and it is nice to see such an elementary series of books containing both scientific and common names.

M.R.W.

Flies of the British Isles by C. N. Colyer, F.R.E.S., F.Z.S. and C. O. Hammond, F.R.E.S. Pp. 384, 52 plates (24 in colour), 50 text figures depicting 286 species. Published in the Wayside and Woodland Series by Frederick Warne & Co. Ltd. Price 55/- Second Edition 1968.

There has been a recent trend amongst our members to take an interest in the, perhaps, less popular orders of insects, such as the Hymenoptera, Odonata and the Diptera. Those members who have chosen the true flies or Diptera have been extremely lucky in having the first edition of this book as an excellent guide. This new edition has been revised and published in an enlarged format but still retains all those features which make it such a remarkable book.

The introductory chapter explains what the flies are, how to distinguish them, their general structure, while also defining the terms used by dipterists in description and identification. Full page figures show the features of each main group of flies and compares their structures. A general account of their life history is given with illustrations of the main larval types. An introduction to classification is also given here.

The bulk of the book deals, in turn, with every family of flies found in the British Isles, each chapter describing a natural group of families. For each family there is given a technical description followed by a description of representative genera and species, including life history and habitat. It is in these sections that the author's personal anecdotes render the book so readable. Notes are also given on medical and agricultural interest.

The book is illustrated through-out by original, enlarged microscope drawings by C. O. Hammond, many of which are in full colour. By means of these, a great many of our most common and interesting flies can be identified at a glance, the identification being checked by consulting the text.

At the end of each section of the book detailed keys to families are provided with other smaller keys in the text. At the end of each chapter are extensive bibliographies enabling the reader to follow up his interest in more specialist publications.

The appendix includes a large section giving detailed accounts of the methods of collection, preservation and examination of flies giving many practical hints. Notes are included on the use of the microscope, and also of methods of packing specimens for posting.

A valuable feature of this section of the book is the glossary, defining approximately 400 technical terms which puzzle many beginners when

using the keys and more advanced books.

This book is suitable not only for the specialist but more specifically for all those interested in our British insects.

R.H.A.

Field and Meadow Life, by Lief Luneborg. Translated from the Danish. Edited in the English edition by Arnold Darlington. pp. 164. 86 colour plates. Blandford Press, London. 21/-.

This work is the latest in the series issued by Blandford Press and follows 'Woodland Life' and 'Pond and Stream Life'. It is meant for the beginner or perhaps better still for the person with a general interest in natural history rather than the specialist in one particular branch. This work appears originally to have been issued in Denmark for the use of the continental naturalist and it has been excellently translated into English. I find however one or two disappointments in this work. Bearing in mind that it is for the general naturalist, why include the Praying Mantis and the Migratory Locust not likely to be met with in the English countryside, or again why include the microlepidoptera like *Nepticula* or *Crambus silvellus* which is incidently given in the text as *C. myellus*? Another thing there is no indication of the relative sizes of the creatures in the illustrations, this can be a little confusing to the beginner. I found the illustrations of the Beetles, Plant Bugs, Flies, Galls etc. very good, I cannot say the same about the Lepidoptera. I found these disappointing in choice and execution. Apart from these criticisms I found this an excellent book, the text is short but informative and sufficient for this type of book.

Pocket Encyclopedia of Plant Galls in Colour, by Arnold Darlington. pp. 111. 292 Illustrations in colour. Blandford Press London. 25/-.

This is the first work of its kind to be published in this country for fifty years, and certainly the only one to be illustrated in colour. I had some criticism of the previous work Field & Meadow Life edited by the author of this book, but I have nothing but praise for this work. The illustrations are first class and considering that this is a pocket book its scope is surprisingly wide and comprehensive. A simple and intelligible explanation of what galls are and what causes them is followed by practical hints on how to collect them. The reader whose interest has been stimulated to enquire further into this branch of natural history will find references and titles for further study in the Introduction. If you are unable to afford this book and I consider 25/- a modest price for this, request your local library to obtain it.

G.P.

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CORRECTION:

EREBIA EPIPHRON Knoch. A NEW ABERRATION OF THE SCOTTISH RACE

The Editor regrets that the titles of the illustrations of this article (*Bull. amat. Ent. Soc.* **27:** 81-3) were inadvertently transposed. The upper illustration on page 81 shows the typical form of *Erebia epiphron* Knoch. The lower illustration shows the ab. *thomsoni* described in the article.

Printed by Ellis & Phillips Ltd., East Side Press, Rye Street, Bishop's Stortford and published by the Amateur Entomologists' Society, 42 Normandy Avenue, Barnet, Herts. 1968

THE AES ADVISORY PANEL

How and when to consult the Panel

Members of the Panel will advise you on the study of their special groups and will identify small numbers of British specimens which are of particular interest to you. Large collections should be taken to a museum for identification. Try to use a copy of the relevant standard work if you know of one, before approaching the Panel.

Always mention that you are approaching the Adviser as he is a member of the Panel and give your own **Membership number.** You must **enclose postage stamps** to cover the cost of a reply or return of specimens. Members of the Panel are busy people, so try to send dead material to them during the winter when their own time is less likely to be taken up with field work. You are recommended to **send a stamped addressed envelope** for acknowledgement of the receipt of material which may have to await time for its indentification. **Labelling** — with details of locality, foodplant, date, time and mode of capture, etc. — often greatly simplifies identification. Every specimen should be fully labelled on the same pin as bears the specimen or its mount. Details of locality will be treated as confidential if this is desired.

The Society is most grateful to the many specialists who serve on this Panel, without any remuneration other than the occasional specimen taken, with permission, from an interesting series that has been sent in. It is hoped that Advisers on those groups that are noticed incidentally or as pests will be sought after as frequently as members of the Panel willing to identify commonly collected Orders.

New advisers on appropriate subjects not covered below are always welcomed by the Hon. General Secretary.

ADVISORY PANEL

Coleoptera (Beetles)

General advice on identification
D. TOZER (36), 98 Copdale Road, Leicester.

Staphylinidae
H. R. LAST (117), 12 Winckworth Road, Banstead, Surrey.

Water-beetles
Prof. J. W. A. F. BALFOUR-BROWNE, M.A., c/o British Museum (Natural History), Cromwell Road, London, S.W.7.

Dipera (Two-winged Flies)

General advice
L. PARMENTER (895), Woodside, Pinewood Road, Ferndown, Dorset.

Larvae (approximate identification)
K. G. V. SMITH, c/o British Museum (Natural History), Cromwell Road, London, S.W.7.

Tachinidae (Parasitic Flies) *and Muscidae*
E. C. M. FONSECA, 58 Woodstock Road, Redland, Bristol 6.

Tipulidae (Crane-flies)
R. M. PAYNE (2982), Westwood, Highwalls Avenue, Dinas Purvis, Glamorgan.

Ephemeroptera (Mayflies)

General advice and identification of larvae and adults
T. T. MACAN, M.A., Ph.D., Stevney, Outgate, Ambleside, Westmorland.

Heteroptera (Het-bugs)

General advice and identification
T. R. E. SOUTHWOOD, B.Sc., Ph.D., Imperial College Field Station, Silwood Park, Sunninghill, Berkshire.

Aquatic species
T. T. MACAN, address above.

Homoptera

Aphidoidea (Greenflies, Blackflies)
H. L. G. STROYAN, M.A., c/o

Insect Pathology Laboratory, Hatching Green, Harpenden, Hertfordshire.

Auchenorhyncha (Leaf-hoppers, etc.)
Dr W. J. LE QUESNE, Anne Cottage, Lye Green Road, Chesham, Buckhamshire.

Hymenoptera

Aculeata (Bees and Wasps)
J. C. FELTON, 'Beechcroft,' 22 Gore Court Road, Sittingbourne, Kent.

Formicoidea (Ants)
C. A. COLLINGWOOD, B.Sc., c/o National Agricultural Advisory Service, Coley Hill, Reading, Berkshire.

Parasitica (Chalcids, Ichneumons, etc.)
G. J. KERRICH, M.A., c/o British Museum (Natural History), Cromwell Road, London, S.W.7.

Symphyta (Sawflies)
Dr V. H. CHAMBERS, 12 Douglas Road, Harpenden, Hertfordshire.

Lepidoptera (Butterflies and Moths)

'Microlepidoptera' —indentification
S. WAKELY (1860), 26 Finsen Road, London, S.E.5.

ditto — *general advice*
D. OLLEVANT (1514), 3 Salcombe Drive, Morden, Surrey.

Noctuid e and their larvae
B. F. SKINNER (2470), 85 Elder Road, West Norwood, London, S.E.27.

Saturniidae (Silkmoths)
B. O. C. GARDINER (225), 18 Chesterton Hall Crescent, Cambridge.

European Butterflies
P. W. CRIBB (2270), 355 Hounslow Road, Hanworth, Nr Feltham, Middlesex.

Odonata (Dragonflies)

General advice and identification
A. E. GARDNER, 29 Glenfield Road, Banstead, Surrey.

Orthopteroids (Cockroaches, Grasshoppers, Mantids, Earwigs, etc).

General advice and identification of British and imported species
A. E. GARDNER, address above.

Plecoptera (Stoneflies)

General advice and identification of larvae and adults
T. T. MACAN, address above.

Thysanoptera (Thrips)

General advice and identification
T. LEWIS, B.Sc., Ph.D., c/o Rothamsted Experimental Station, Harpenden, Hertfordshire.

Trichoptera (Caddisflies)

General advice and identification
T. T. MACAN, address above.

Insect Migration

Recorder and Adviser
R. A. FRENCH, B.Sc., (2129), Rothamsted Experimental Station, Harpenden, Hertfordshire.

Botany

Identification of foodplants
H. K. AIRY SHAW (545), Royal Botanic Gardens, Kew, Surrey.

Selection, propagation and cultivation of foodplants and floral attractions
R. C. DYSON (91), 58 Stanford Avenue, Brighton 6, Sussex.

Plant Galls
D. LEATHERDALE, Eastfield Lodge, Whitchurch, Nr. Pangbourne, Berkshire.

Apparatus and Techniques (except microscopy)

General advice
M. E. CASTLE (2490), 'Avellana,' 172 Greenfield Crescent, Hazelton Gardens, Horndean, Hampshire.

Microscopy

General Advice
G. W. SWAYNE, A.I.S.T., F.R.M.S. (3949), 22A Thorpe Road, S. Tottenham, London, N.15.

Photography

35mm. still and general advice.
R. W. J. UFFEN (1660), 4 Vaughan Avenue, Stamford Brook, London, W.6.

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